

# BBL® AEROBIC AND ANAEROBIC SYSTEMS

Accessories & replacement parts for these systems are found at the bottom of this page. Discounts are offered to all Federal, State and Educational entities.

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[BBL MAIN MENU](#) | [DIFCO MAIN MENU](#) |



## BBL® BIO-BAG® ENVIRONMENTAL CHAMBERS

Description	BBL No.	Sale Unit	Price USD
Type A, 100 Pack	261214	Pack of 100	\$369.30
Type A, 25 Pack	261215	Pack of 25	\$103.70
Type A Multi-Plate; holds three 100 x 15 mm multi-plate dishes or two API ID strips	261216	Pack of 50	\$300.10
Type Cfj, 100 Pack	261211	Pack of 100	\$350.70
Type Cfj, 25 Pack	261212	Pack of 25	\$94.20
Type C	261510	Pack of 50	\$64.20
CO2 Indicator Strip	271055	Pack of 50	\$49.30

## GASPAK 100® SYSTEMS

The economical nonvented model can be used for anaerobic procedures. The vented model can be used with evacuation-replacement systems using tank gases. Both the nonvented and vented models hold twelve 100 x 15mm petri dishes or 13 culture tubes. Nonvented model and vented model (if tank system is not used) require a disposable gas generator envelope (see Accessories). Both models come with 5 O.D. x 9 in.H (13 x 23cm) polycarbonate jar; lid with O-ring gasket (vented or nonvented depending on model); clamp and thumbscrew assembly; catalyst reaction chamber; 2 catalyst charges; autoclavable, stainless-steel Petri dish rack with clips; and culture tube holder. Vented model also supplied with rubber hose and tubing clamp.

Model	BBL No.	Sale Unit	Price USD
Vented	260627	Each	\$526.20
Nonvented	260626	Each	\$407.40

## ACCESSORIES

### DISPOSABLE GAS GENERATOR ENVELOPES

Use in GasPak® Jar Systems to produce anaerobic, microaerophilic, or CO<sub>2</sub>-supplemented aerobic atmospheres. Each specially designed foil envelope emits its gases when you add 10mL water.

#### GasPak® Hydrogen + CO<sub>2</sub>

For CO<sub>2</sub>-enriched anaerobic environment. Contains one tablet sodium borohydride and one tablet sodium bicarbonate and citric acid.

#### GasPak Plus® Hydrogen + CO<sub>2</sub> with Safety-Shielded Integral Palladium Catalyst Strip

For CO<sub>2</sub>-enriched anaerobic environment. Assures accurate quantities of fresh, active catalyst for every run. Identical contents to 270304, plus palladium catalyst strip.

#### GasPak® CO<sub>2</sub>

Produces CO<sub>2</sub>-enriched/aerobic environment for the cultivation of *Neisseriae*, *Brucellae*, *Mycobacteria*, and other organisms and tissue cultures. Contains one tablet sodium bicarbonate and citric acid.

#### CampyPak® Hydrogen + CO<sub>2</sub>

Produces microaerophilic environment for growth and isolation of *Campylobacter jejuni*. Produces atmosphere approximately 5 to 12% CO<sub>2</sub>; residual atmosphere of approximately 5 to 15% oxygen.¥ Contains one tablet sodium borohydride and one tablet sodium bicarbonate and citric acid.

#### CampyPak Plus® Hydrogen + CO<sub>2</sub> with Integral Palladium Catalyst

Produces microaerophilic environment for growth of *Campylobacter* and *Campylobacter*-like strains. Assures accurate quantities of fresh, active catalyst for every run. Produces atmosphere approximately 5 to 12% CO<sub>2</sub>; residual atmosphere approximately 5 to 15% oxygen. Safety ensured by delayed release of hydrogen gas via a paper wick system.¥ Identical contents to 271034, plus palladium catalyst.

Description	BBL No.	Sale Unit	Price USD
GasPak® Hydrogen + CO <sub>2</sub>	270304	Pack of 10	\$21.90
GasPak Plus® Hydrogen + CO <sub>2</sub> with safety-shielded integral palladium catalyst strip.	271040	Pack of 10	\$25.70
GasPak CO <sub>2</sub>	270308	Pack of 10	\$24.10
CampyPak® Hydrogen + CO <sub>2</sub> ¥	271034	Pack of 10	\$27.40
CampyPak Plus® Hydrogen + CO <sub>2</sub> with integral palladium catalyst.¥	271045	Pack of 10	\$32.40

¥ *Campylobacter jejuni* produces hydrogen sulfide. Since this degrades the palladium catalyst, fresh catalyst should be placed in the catalyst chambers of the GasPak® lid each time the jar is used with a CampyPak® envelope.

### GASPAK® DRY ANAEROBIC INDICATOR STRIPS

Recommended for use with BBL GasPak Plus® anaerobic envelopes. Also usable in BBL gas-generating pouch systems. Convenient strips change from blue to colorless in the absence of oxygen. No refrigeration needed.

BBL No.	Sale Unit	Price USD
271051	Pack of 100	\$71.10

## GASPAK 150® SYSTEMS

Same as GasPak 100® Systems, but with larger jar to hold thirty-six 100 x 15mm Petri dishes, twelve 150 x 15mm Petri dishes, or 13 culture tubes. The nonvented model and vented model also require a gas generator envelope if tank system is not used. Each system comes with 10 1/2" O.D. x 11" H (27 x 28cm) polycarbonate jar; lid with O-ring gasket (vented or nonvented depending on model); clamp and thumb-screw assembly; 3 catalyst reaction chambers; 10 catalyst charges; autoclavable, stainless-steel Petri dish rack with clips; and culture tube holder. Vented model also supplied with rubber hose and tubing clamp.

Model	BBL No.	Sale Unit	Price USD
Vented	260629	Each	\$688.10
Nonvented	260628	Each	\$611.50

## BBL® POUCH SYSTEMS

These systems are used to create anaerobic, microaerophilic, or CO<sub>2</sub>-enriched aerobic environment within a bag or sack. Liquid-activating reagent initiates atmosphere development in one step. No gas tanks or catalysts needed. Minimal heat and hydrogen produced which lessens the amount of condensation for improved visibility. Pouches and sacks can be heat-sealed, or sealed with Sealing Bars listed below.

GasPak Pouch® System ~ Produces a CO<sub>2</sub>-enriched anaerobic environment for the isolation, cultivation, and identification of anaerobic bacteria. System contains 25 incubation pouches, each with integral reagent sachet and anaerobic indicator, and 25 liquid-activating reagent packets.

GasPak CO<sub>2</sub> Pouch® System ~ Provides a CO<sub>2</sub>-enriched aerobic atmosphere for excellent colony visualization. Contains two plastic-sealed packs of 25 pouches with integral reagent sachets and 50 liquid-activating reagent packets.

Campy Pouch® System ~ Produces a microaerophilic environment. Contains 25 incubation pouches, each with integral reagent sachet, and 25 liquid-activating reagent packets. Shipped in five protective overpacks.

Description	BBL No.	Sale Unit	Price USD
GasPak Pouch® System.	260651	Pack of 25	\$97.10
GasPak CO <sub>2</sub> Pouch® System.	260662	Pack of 50	\$76.80
Campy Pouch® System.	260656	Pack of 25	\$86.60

## GASPAK POUCH SEALING BARS

BBL No.	Sale Unit	Price USD
260652	Pack of 10	\$17.30

**GASPAK® DISPOSABLE ANAEROBIC INDICATOR**

For use in all GasPak® Jar Systems. Consists of a foil envelope containing a pad saturated with methylene blue solution. The pad changes from blue to colorless in the absence of oxygen.

BBL No.	Sale Unit	Price USD
270504	Pack of 100	\$71.10

**VENT KIT**

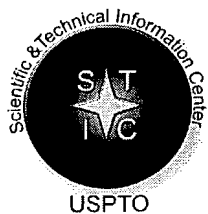
Converts GasPak 150® Nonvented System to a vented system. Consists of threaded vent, rubber tubing, and tubing clamp.

BBL No.	Sale Unit	Price USD
260609	Each	\$84.40

**REPLACEMENT PARTS**

Part Description	BBL No.	Sale Unit	Price USD
<b>For GasPak 100 and GasPak 150 Systems</b>			
Catalyst reaction chamber	260412	Each	\$57.20
Catalyst charges	270303	Pack of 10	\$79.70
<b>For GasPak 150 Systems Only</b>			
Anaerobic nonvented jar	260607	Each	\$210.40
Lid assembly2	260610	Each	\$389.60
Petri dish rack	260618	Each	\$95.00

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# **STIC Search Report**

## **Biotech-Chem Library**

**STIC Database Tracking Number: 121812**

**TO: Ralph J Gitomer**  
**Location: REM-3E71**  
**Art Unit: 1651**  
**Monday, May 17, 2004**

**Case Serial Number: 09/897105**

**From: David Schreiber**  
**Location: Biotech-Chem Library**  
**Remsen E01A61**  
**Phone: 272-2526**

**david.schreiber@uspto.gov**

### **Search Notes**

121812

Access DB# \_\_\_\_\_

## SEARCH REQUEST FORM

Scientific and Technical Information Center

RECEIVED  
MAY 11 2009  
(STIC)

Requester's Full Name: R GITOMEN Examiner #: 69630 Date: 5/11/09  
Art Unit: 1651 Phone Number 30 \_\_\_\_\_ Serial Number: 09/897,105  
Mail Box and Bldg/Room Location: \_\_\_\_\_ Results Format Preferred (circle): PAPER DISK E-MAIL

3671

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: \_\_\_\_\_

Inventors (please provide full names): \_\_\_\_\_

Earliest Priority Filing Date: \_\_\_\_\_

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

I CAN'T FIND THE UNDERLINED FEATURE

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## STAFF USE ONLY

## Type of Search

## Vendors and cost where applicable

Searcher: <u>D Schubert</u>	NA Sequence (#) _____	STN <u>451.17</u>
Searcher Phone #: <u>272-2520</u>	AA Sequence (#) _____	Dialog _____
Searcher Location: <u>Remse FOI A61</u>	Structure (#) _____	Questel/Orbit _____
Date Searcher Picked Up: _____	Bibliographic <input checked="" type="checkbox"/>	Dr.Link _____
Date Completed: <u>5/17</u>	Litigation _____	Lexis/Nexis _____
Searcher Prep & Review Time: <u>39</u>	Fulltext _____	Sequence Systems _____
Clerical Prep Time: _____	Patent Family _____	WWW/Internet <input checked="" type="checkbox"/>
Online Time: <u>97</u>	Other _____	Other (specify) _____

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(FILE 'MEDLINE, HCAPLUS, BIOSIS, EMBASE, WPIDS, SCISEARCH, AGRICOLA'  
 ENTERED AT 14:47:03 ON 17 MAY 2004)

L22 86 DUP REM L21 (29 DUPLICATES REMOVED)

=&gt; d que 122

L1 15663 SEA OGAWA H?/AU  
 L2 84 SEA L1 AND CARBON(3A) DIOXIDE  
 L3 3 SEA L2 AND INDICATOR#  
 L4 15915 SEA CARBON(A) DIOXIDE(5A) (DETECT? OR INDICAT? OR MEASUR?)  
 L5 109 SEA L4 (5A) PERMEA?  
 L6 4 SEA L5 AND (BACTERI? OR FUNG? OR MICROB?)  
 L10 73 SEA L4 (5A) MEMBRAN?  
 L11 7 SEA L10 AND (BACTERI? OR FUNG? OR MICROB?)  
 L12 1 SEA L11 AND BAG?  
 L13 66 SEA L10 NOT L11  
 L14 71 SEA L3 OR L6 OR L12 OR L13  
 L16 2853 SEA CARBON(3A) DIOXIDE(5A) SENSOR?  
 L17 105 SEA L16 AND (BACTERI? OR FUNG? OR MICROB?)  
 L18 89 SEA L17 NOT (MICROBOLO? OR MICROBALAN?)  
 L19 159 SEA L18 OR L14  
 L20 112 SEA L19 NOT PY>1998  
 L21 115 SEA L20 OR L3  
 L22 86 DUP REM L21 (29 DUPLICATES REMOVED)

=&gt; d ibib abs 122 1-86

L22 ANSWER 1 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:228143 HCAPLUS  
 DOCUMENT NUMBER: 136:243985  
 TITLE: Method and tool for detecting fungus  
 INVENTOR(S): Ogawa, Hiroyuki  
 PATENT ASSIGNEE(S): Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002085090	A2	20020326	JP 2000-278941	20000913
PRIORITY APPLN. INFO.:			JP 2000-278941	20000913

AB A method and a tool are provided for detecting fungus within a short time by maintaining the high humidity suited for fungus proliferation and stimulating the formation of spores while preventing the contamination by floating spores. A liquid-holding material comprises a piece of tissue paper made of cellulose which is cut into a long and narrow piece. This liquid-holding material for absorbing and holding a liquid culture medium for fungus is accommodated in a container which can be sealed. A transparent sack possessing the **carbon dioxide** permeability and containing a color **indicator** for **carbon dioxide** is accommodated in the sealed container. The container possesses a transparent part through which the transparent sack is seen from the outside. A diagram describing the tool assembly is given.

L22 ANSWER 2 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:479263 HCAPLUS  
 DOCUMENT NUMBER: 135:43452  
 TITLE: Apparatus and culture media for determination of  
 microorganism and method for microorganism  
 determination  
 INVENTOR(S): Ogawa, Hiroyuki  
 PATENT ASSIGNEE(S): Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001178496	A2	20010703	JP 1999-368260	19991224
PRIORITY APPLN. INFO.:			JP 1999-368260	19991224

AB The apparatus contains liquid culture medium, and a CO2-indicating agent kept in a liquid barrier and CO2-permeable membrane. The microorganism of interest is introduced into the liquid medium containing growth promoter for the microorganism of interest and growth inhibitor for other microorganism. Compared to the growth of the contaminated microoragshim, the time required for the growth of the microorganism of interest and coloring (change) of the CO2-indicating agent is greatly shorten and it is used to calculated the number of the microorganism of interest and for diagnosis of the microorganism of interest. The method is not affected by contaminated microorganism.

L22 ANSWER 3 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1999:420653 HCAPLUS  
 DOCUMENT NUMBER: 131:70852  
 TITLE: Detection of microorganisms based on colorimetry of  
**carbon dioxide**, tool for the method,  
 and apparatus equipped with the tool  
 INVENTOR(S): Ogawa, Hiroyuki  
 PATENT ASSIGNEE(S): Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11178597	A2	19990706	JP 1997-365342	19971218
JP 3225484	B2	20011105		
EP 930368	A2	19990721	EP 1998-310484	19981218
EP 930368	A3	20040317		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
US 2001039033	A1	20011108	US 2001-897105	20010703
PRIORITY APPLN. INFO.:			JP 1997-365342	A 19971218
			US 1998-213872	A3 19981217

AB Microorganisms are detected by adding a sample in a container in which a liquid culture medium and a color **indicator** for CO2 are placed



sep. via a CO<sub>2</sub>-permeable membrane and sealing the container to measure whether the **indicator** is colored or not. Number of microorganisms is measured based on the time from the point when the container is sealed to the point the coloration of the **indicator** reaches a certain value. A tool for determining microorganisms comprises a sealable container having a part for a liquid culture medium and another part for a CO<sub>2</sub> **indicator**, e.g. NaOH and thymolphthalein, via a CO<sub>2</sub>-permeable membrane, e.g. a polypropylene film, and the container has a transparent part through which coloration of the **indicator** can be viewed. Also claimed is apparatus comprising the tool, a color sensor, and an alarm.

L22 ANSWER 4 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 1

ACCESSION NUMBER: 1998:760647 HCAPLUS  
DOCUMENT NUMBER: 130:94592  
TITLE: Simple flow injection analysis system for determination of added sugars in dairy products  
AUTHOR(S): Corton, Eduardo; Locascio, Guillermo  
CORPORATE SOURCE: Departamento de Quimica Biologica, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires, Ciudad Universitaria, Buenos, 1428, Argent.  
SOURCE: Journal of Dairy Research (1998), 65(4), 675-680  
CODEN: JDRSAN; ISSN: 0022-0299  
PUBLISHER: Cambridge University Press  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB A **microbial sensor** based on a **carbon dioxide** electrode coupled with immobilized *Saccharomyces cerevisiae* (baker's yeast) was used for the determination of sucrose in dairy products. The sensor was used as the detector in a flow injection anal. system. Calibration curves for sucrose were established from 1 to 100 g/L. Detns. for several dairy products containing added sucrose gave good agreement with the concns. given by manufacturers. Typically, the SE of the method was shown to be <5% of the calculated mean.

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L22 ANSWER 5 OF 86 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN DUPLICATE 2

ACCESSION NUMBER: 1998:270351 BIOSIS  
DOCUMENT NUMBER: PREV199800270351  
TITLE: On-line monitoring of a cultivation using an electronic nose.  
AUTHOR(S): Liden, Helena [Reprint author]; Mandenius, Carl-Fredrik; Gorton, Lo; Meinander, Nina Q.; Lundstrom, Ingemar; Winqvist, Fredrik  
CORPORATE SOURCE: Dep. Anal. Chem., Lund Univ., P.O. Box 124, S-221 00 Lund, Sweden  
SOURCE: Analytica Chimica Acta, (April 17, 1998) Vol. 361, No. 3, pp. 223-231. print.  
CODEN: ACACAM. ISSN: 0003-2670.  
DOCUMENT TYPE: Article  
LANGUAGE: English  
ENTRY DATE: Entered STN: 24 Jun 1998  
Last Updated on STN: 24 Jun 1998

AB An ethanol batch cultivation with the yeast *Saccharomyces cerevisiae* was monitored on-line using an electronic nose. Head space samples were pumped past an array of gas sensors. The sensor array contained ten metal oxide semiconductor field effect transistors, four semiconducting tin dioxide based **sensors** and an optical **carbon**

**dioxide** detector. Off-line analysis of the ethanol concentration was performed intermittently with a gas chromatograph. The on-line and off-line data were evaluated using pattern recognition techniques. Principal component analysis was used to visualize the course of the cultivation and to determine which sensors supplied the most important information, thereby reducing the number of variables in the data sets. Three of the reduced data sets were used as inputs for training a 5:4:1 back-propagation artificial neural network to predict the ethanol concentration in the broth. The root mean square error of the ethanol predictions for the validation set was 4.6%. The study demonstrates the possibility of monitoring a bioprocess with gas sensors in combination with principal component analysis and artificial neural networks.

L22 ANSWER 6 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1997:479389 HCAPLUS  
 DOCUMENT NUMBER: 127:99469  
 TITLE: Method and apparatus for the measurement of dissolved carbon  
 INVENTOR(S): Godec, Richard D.; O'Neill, Kevin J.; Hutte, Richard  
 PATENT ASSIGNEE(S): Sievers Instruments, Inc., USA  
 SOURCE: PCT Int. Appl., 54 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9721096	A1	19970612	WO 1996-US19217	19961203
W: JP				

RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE  
 PRIORITY APPLN. INFO.: US 1995-567372 A 19951204

AB Apparatus and methods for the measurement of total organic carbon, total inorg. carbon and total carbon of water are described. The sample is acidified and split into an inorg. carbon stream and a total carbon stream. The inorg. carbon in the inorg. stream is oxidized using an oxidizer potential that varies over an oxidizer potential period, and both the organic carbon in the total carbon stream are oxidized. The resulting carbon dioxide is **measured** in each stream using **carbon dioxide** sensors employing a gas permeable **membrane** dividing deionized water from the oxidized sample water and a pair temperature and conductivity cells.

L22 ANSWER 7 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1997:151629 HCAPLUS  
 DOCUMENT NUMBER: 126:161918  
 TITLE: Method and apparatus for determination of dissolved carbon in water  
 INVENTOR(S): Godec, Richard; O'Neill, Kevin J.; Hutte, Richard  
 PATENT ASSIGNEE(S): Sievers Instruments, Inc., USA  
 SOURCE: PCT Int. Appl., 39 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 9  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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 WO 9703354 A1 19970130 WO 1996-US11623 19960712  
 W: JP  
 RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE  
 US 5820823 A 19981013 US 1995-501597 19950712  
 EP 871877 A1 19981021 EP 1996-924468 19960712  
 R: DE, FR, GB  
 PRIORITY APPLN. INFO.:  
 US 1995-501597 A 19950712  
 US 1990-487720 A3 19900302  
 US 1992-869308 A2 19920416  
 WO 1996-US11623 W 19960712

AB Apparatus and method for the measurement of total organic carbon, total inorg. carbon and total carbon in water are described. The sample is acidified and split into an inorg. carbon stream and a total carbon stream. The inorg. carbon in the inorg. stream is oxidized and both the organic and inorg. carbon in the total carbon stream is oxidized. The resulting carbon dioxide is **measured** in each stream using **carbon dioxide** sensors employing a gas permeable **membrane** dividing deionized water from the oxidized sample water and a pair of micro-conductivity and temperature sensors.

L22 ANSWER 8 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:166037 HCAPLUS  
 DOCUMENT NUMBER: 128:248980  
 TITLE: Chemical vapor deposition of SnO<sub>2</sub> films within the pores of Vycor substrates for the control of their porosity  
 AUTHOR(S): Magouliauiti, E. A.; Beltsios, K.; Davazoglou, D.; Romanos, G.; Kanellopoulos, N.  
 CORPORATE SOURCE: Inst. Physical Chem., Inst. Microelectronics, Attikis, GR-15310, Greece  
 SOURCE: Proceedings - Electrochemical Society (1997), 97-25 (Chemical Vapor Deposition), 576-583  
 CODEN: PESODO; ISSN: 0161-6374  
 PUBLISHER: Electrochemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB SnO<sub>2</sub> films were chemical vapor deposited within the 40 Å-diameter pores of Vycor tubes using a home-made hot wall reactor at atmospheric pressure and temps. in the vicinity of 500°. SnCl<sub>4</sub> vapor was used as metal precursor flowing through the Vycor tube. A mixture of steam/O flowing outside of the tube was used as a hydrolyzing/oxidizing agent. SEM and electronic micro-anal. measurements showed that the deposition is made on the inside wall and within the pores of the Vycor tube with a depth depending on the deposition conditions. Differential permeability measurements with supercrit. CO<sub>2</sub> indicate a population of surface micropores (pore diameter distribution possibly peaking <13 Å) which plays a significant role in permeability.

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L22 ANSWER 9 OF 86 EMBASE COPYRIGHT 2004 ELSEVIER INC. ALL RIGHTS RESERVED. on STN

ACCESSION NUMBER: 97139335 EMBASE  
 DOCUMENT NUMBER: 1997139335  
 TITLE: Lower respiratory rates without decreases in oxygen consumption during neonatal synchronized intermittent mandatory ventilation.

AUTHOR: Smith K.M.; Wahlig T.M.; Bing D.R.; Georgieff M.K.; Boros S.J.; Mammel M.C.  
CORPORATE SOURCE: M.C. Mammel, Department of Neonatal Medicine, Children's Hospital of St Paul, 345 North Smith Avenue, St Paul, MN 55102, United States. mamme001@maroon.tc.umn.edu  
SOURCE: Intensive Care Medicine, (1997) 23/4 (463-468).  
Refs: 35  
ISSN: 0342-4642 CODEN: ICMED  
COUNTRY: Germany  
DOCUMENT TYPE: Journal; Article  
FILE SEGMENT: 007 Pediatrics and Pediatric Surgery  
024 Anesthesiology  
LANGUAGE: English  
SUMMARY LANGUAGE: English  
AB Objective: We tested the hypothesis that synchronization to patient effort during intermittent mandatory ventilation (SIMV), when compared to conventional unsynchronized intermittent mandatory ventilation (IMV), will decrease energy expenditure, as reflected by decreased oxygen consumption (VO<sub>2</sub>). Design: We used a four-period crossover design. Each patient was studied over four 30-min continuous time intervals. Patients were randomized to receive initially IMV or SIMV, then crossed over such that each patient was treated twice with each modality. Data were analyzed using an analysis of variance technique. Setting: Patients were receiving treatment in the newborn intensive care unit of Children's Hospital, St. Paul. Patients: We studied 17 patients, who ranged from 23 to 37 weeks gestation, were  $\leq 14$  days old, and had study weights from 623 to 3015 g. All were mechanically ventilated for hyaline **membrane** disease. Measurements and results: We **measured** and compared VO<sub>2</sub>, **carbon dioxide** consumption (VCO<sub>2</sub>), minute ventilation (V(E)), total respiratory rate, heart rate, arterial blood pressure, and arterial oxygen saturation (SaO<sub>2</sub>) values during IMV and SIMV. Total respiratory rate fell significantly during SIMV ( $73 \pm 26$  during IMV,  $57 \pm 17$  during SIMV,  $p < 0.01$ ) in spite of no significant change in VO<sub>2</sub> ( $0.6 \pm 0.16\%$  fall in VO<sub>2</sub> during SIMV) or VCO<sub>2</sub> ( $4.2 \pm 0.19\%$  increase in VCO<sub>2</sub> during SIMV) values. Moreover, there were no significant differences in heart rate, blood pressure, V(E), or SaO<sub>2</sub> values with either form of therapy. Conclusions: Though total respiratory rate fell, these data do not support the hypothesis that SIMV significantly reduces respiratory rate by decreasing oxygen consumption and carbon dioxide production during infant mechanical ventilation. Rather, the marked fall in respiratory rate may be due to a more efficient respiratory pattern.

L22 ANSWER 10 OF 86 MEDLINE on STN DUPLICATE 3  
ACCESSION NUMBER: 97467961 MEDLINE  
DOCUMENT NUMBER: PubMed ID: 9324959  
TITLE: Measurement of carbonic anhydrase activity using a sensitive fluorometric assay.  
AUTHOR: Shingles R; Moroney J V  
CORPORATE SOURCE: Department of Biology, The Johns Hopkins University, Baltimore, Maryland 21218-2685, USA.  
SOURCE: Analytical biochemistry, (1997 Oct 1) 252 (1) 190-7.  
Journal code: 0370535. ISSN: 0003-2697.  
PUB. COUNTRY: United States  
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
LANGUAGE: English  
FILE SEGMENT: Priority Journals  
ENTRY MONTH: 199711  
ENTRY DATE: Entered STN: 19971224  
Last Updated on STN: 19971224

Entered Medline: 19971117

AB The dehydration reaction of bicarbonate was measured using the fluorescent pH indicator, 8-hydroxypyrene-1,3,6-trisulfonate (pyranine), in combination with stopped-flow spectrofluorometry. The initial rate of bicarbonate dehydration was measured after mixing a pH 6.0 solution with a pH 8.0 solution containing bicarbonate. Addition of carbonic anhydrase to the pH 6.0 solution enabled the measurement of the initial rate of activity at physiological temperatures with resolution times of 2 ms. This assay was used to resolve differences in activity and sensitivity to sulfonamides by comparing mammalian carbonic anhydrase isoforms. The fluorescent technique used in this study is very sensitive, allowing the determination of initial rates with a protein concentration as little as 65 ng/ml. Pyranine can also be loaded into membrane vesicles to follow carbonic anhydrase activity within vesicles. The change in pH within vesicles is dependent on the concentration of externally added bicarbonate and the presence of carbonic anhydrase on either side of the membrane. Therefore, this assay can be used to **measure carbon dioxide flux across membranes** and to assess the contribution of carbonic anhydrase to this flux.

L22 ANSWER 11 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 4

ACCESSION NUMBER: 1997:358071 HCAPLUS

DOCUMENT NUMBER: 127:106132

TITLE: Hemoglobin modified bilayer lipid **membranes** (BLMs) biosensor for **carbon dioxide detection**

AUTHOR(S): Nikolelis, D. P.; Siontorou, C. G.

CORPORATE SOURCE: Laboratory of Analytical Chemistry, Department of Chemistry, University of Athens, Panepistimiopolis-Kouponia, 15771, Athens, Greece

SOURCE: Bioelectrochemistry and Bioenergetics (1997), 42(1), 71-75

CODEN: BEBEBP; ISSN: 0302-4598

PUBLISHER: Elsevier

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The present paper describes the modification of self-assembled bilayer lipid membranes (s-BLMs) on a metal support with Hb to develop a novel electrochem. minisensor for the rapid detection of carbon dioxide. Modification was achieved by the introduction of Hb into the bulk electrolyte solution and ion conductivity of BLMs increased with addns. of NaHCO<sub>3</sub> in solution. The detection limit of CO<sub>2</sub> detection was 0.375  $\mu$ M using BLMs containing 15% DPPA. The reversibility of the phenomenon of carbon dioxide binding to Hb could be investigated by the use of s-BLMs. The present carbon dioxide sensor can be fabricated at low cost, with fast response times (about 10 s) and the capability of analyzing small vols. of samples. The long-term stability of the Hb modified BLM-based biosensor is routinely over 48 h.

L22 ANSWER 12 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1996:342231 HCAPLUS

DOCUMENT NUMBER: 125:9137

TITLE: Procedure and apparatus for measuring carbon dioxide in beverages and other liquids

INVENTOR(S): Ohlrogge, Klaus; Hasler, Carsten; Wind, Jan; Waldemann, Rudolf; Cegla, Dieter; Steffens, Franz Josef

PATENT ASSIGNEE(S): Gkss-Forschungszentrum Geesthacht GmbH, Germany;

SOURCE: Fisher-Rosemount GmbH and Co.  
 Ger. Offen., 8 pp.  
 CODEN: GWXXBX  
 DOCUMENT TYPE: Patent  
 LANGUAGE: German  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 4439715	A1	19960515	DE 1994-4439715	19941109
PRIORITY APPLN. INFO.:			DE 1994-4439715	19941109

AB Carbon dioxide in beverages is measured continuously by passing the liquid over the retentate side of a **carbon dioxide**-permeable **membrane** and **measuring** the flux of gas on the permeate side by using IR spectroscopy. The concentration of the dissolved gas can be calculated if the temperature of the liquid is known.

L22 ANSWER 13 OF 86 WPIDS COPYRIGHT 2004 THOMSON DERWENT on STN  
 ACCESSION NUMBER: 1996-059153 [07] WPIDS  
 DOC. NO. NON-CPI: N1996-049341  
 TITLE: Electrode device for **carbon dioxide** partial pressure **measurement** - has shaft sleeve with glass **membrane** at its end provided with outer electrode annular surface at same height as inner electrode.  
 DERWENT CLASS: S02 S03  
 INVENTOR(S): KADEN, H; OELSSNER, W; SCHINDLER, W  
 PATENT ASSIGNEE(S): (AUER) AUERGESELLSCHAFT GMBH  
 COUNTRY COUNT: 1  
 PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
DE 4424213	A1	19960111	(199607)*		5
DE 4424213	C2	19970213	(199711)		5

## APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
DE 4424213	A1	DE 1994-4424213	19940709
DE 4424213	C2	DE 1994-4424213	19940709

PRIORITY APPLN. INFO: DE 1994-4424213 19940709

AN 1996-059153 [07] WPIDS

AB DE 4424213 A UPAB: 19960222

The electrode device has a pH glass electrode with a glass membrane across the end face of a cylindrical glass shaft sleeve. An annular surface applied to the shaft sleeve acts as an outer reference electrode (4), in contact with an electrolyte solution (8) containing a hydrocarbon, forming a thin layer between the glass membrane and diffusion membrane allowing passage of the carbon dioxide.

The annular surface lies at the same height relative to the shaft sleeve as an inner electrode (5) and is contacted by an electrolyte solution layer with a thickness of below 0.5 mm.

USE - For electrochemical potentiometric sensor providing partial pressure of carbon dioxide in liquid or gas.

Dwg.1/2.

L22 ANSWER 14 OF 86 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN  
 ACCESSION NUMBER: 1997:100477 BIOSIS  
 DOCUMENT NUMBER: PREV199799399680  
 TITLE: Fluorescence-based optical sensors for biomedical applications.  
 AUTHOR(S): Wolfbeis, O. S.  
 CORPORATE SOURCE: Univ. Regensburg, Inst. Physical Macromolecular Chem., Regensburg, Germany  
 SOURCE: Verga Scheggi, A. M. [Editor]; Martellucci, S. [Editor]; Chester, A. N. [Editor]; Pratesi, R. [Editor]. NATO ASI Series Series E Applied Sciences, (1996) pp. 327-337. NATO ASI Series Series E Applied Sciences; Biomedical optical instrumentation and laser-assisted biotechnology. Publisher: Kluwer Academic Publishers, PO Box 989, 3300 AZ Dordrecht, Netherlands; Kluwer Academic Publishers, 101 Phillip Drive, Norwell, Massachusetts 02061, USA. Series: NATO ASI Series Series E Applied Sciences. Meeting Info.: NATO Advanced Study Institute Proceedings. Erice, Italy. November 10-22, 1995. ISSN: 0168-132X. ISBN: 0-7923-4172-4.  
 DOCUMENT TYPE: Book; (Book Chapter)  
 LANGUAGE: English  
 ENTRY DATE: Entered STN: 3 Mar 1997  
 Last Updated on STN: 3 Mar 1997

L22 ANSWER 15 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 1998:608986 HCAPLUS  
 DOCUMENT NUMBER: 129:235307  
 TITLE: In-situ respiration measurement using a subsurface **carbon dioxide sensor**  
 AUTHOR(S): Li, Dong X.  
 CORPORATE SOURCE: Unocal Corporation, Brea, CA, USA  
 SOURCE: Proceedings, Annual Meeting - Air & Waste Management Association (1996), 89th, fa15802/1-fa15802/7  
 CODEN: PAMEE5; ISSN: 1052-6102  
 PUBLISHER: Air & Waste Management Association  
 DOCUMENT TYPE: Journal; (computer optical disk)  
 LANGUAGE: English

AB Respiration rate of soil is one of best indicators of biodegrdn. processes in a subsurface environment. In-situ respiration measurement of oxygen consumption and/or carbon dioxide production in the vadose zone using subsurface sensors is the fastest and one of the most accurate methods to assess biol. activities in subsurface soil regions. Because of the very low ambient CO<sub>2</sub> level (0.03%), a CO<sub>2</sub> measurement is inherently more sensitive than that of O<sub>2</sub>. Therefore, a shorter respirometry test is needed to detect measurable change in CO<sub>2</sub> concentration using a CO<sub>2</sub> sensor. A shorter respirometry test requires a shorter period of air injection. An in-situ respirometry test was conducted in the field using a new subsurface CO<sub>2</sub> sensor, based on non-dispersive IR (NDIR) absorption. The respiration rate is in good agreement with the result measured by using a subsurface oxygen sensor in the same location. The whole process of air injection and in-situ respirometry test can be performed by using CO<sub>2</sub> sensors for a much shorter time (an hour or less). A short respirometry test has advantages of minimizing disturbance to a subsurface biol. environment, and allowing determination of a more localized respiration rate. Combining **carbon dioxide sensor** with other

subsurface **sensors** offers an improved approach for bioremediation feasibility evaluation and respiration measurements. The application of this new technique and its advantages and disadvantages is documented in a case study.

L22 ANSWER 16 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 5

ACCESSION NUMBER: 1996:643270 HCAPLUS

DOCUMENT NUMBER: 125:279595

TITLE: Transport mechanism of carbon dioxide through perfluorosulfonate ionomer membranes containing an amine carrier

AUTHOR(S): Yamaguchi, Takeo; Koval, Carl A.; Nobel, Richard D.; Bowman, Christopher

CORPORATE SOURCE: Dep. Chem. Engineering, University Colorado, Boulder, CO, 80309-0424, USA

SOURCE: Chemical Engineering Science (1996), 51(21), 4781-4789  
CODEN: CESCAC; ISSN: 0009-2509

PUBLISHER: Elsevier

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A new facilitated transport model for CO<sub>2</sub> through ion-exchange membranes containing a diamine complexing agent was developed. The diamine ion behaves as a mobile carrier for CO<sub>2</sub>. Although the morphol. of the ion-exchange membrane affects carrier transport, the effect of morphol. on ionic carrier transport is not clear. The Nernst-Planck equation and the penetration model were employed in this modeling study. The elec. double layer effect and friction effect in the ion-exchange membrane was also considered. In the membrane, there are two kinds of counter ions (NH<sub>3</sub><sup>+</sup>-R-NH<sub>2</sub> and NH<sub>3</sub><sup>+</sup>-R-NH<sub>3</sub><sup>+</sup>), CO<sub>2</sub> and NH<sub>3</sub><sup>+</sup>-R-NHCOO<sup>-</sup> (carbamate ion). The carbamate ion can be treated as a neutral mol. because it has both plus and minus charge. Com. Nafion 117 (N117) and heat treated Nafion 117 (HN117) were used as ion-exchange membranes. The water content of N117 and HN117 was 16 and 45%, resp. Nafion has cluster channels which were filled with water, and HN117 has a larger cluster channel size than N117. Monoprotonated ethylenediamine was used as a carrier. Mobile counter ion diffusivities were measured by membrane conductivity. **Carbon dioxide** diffusivity was determined from transport **measurements** in a nonreactive Nafion **membrane**. The diffusivity ratio of carbamate ion to CO<sub>2</sub> was estimated by the group contribution method which is effective in aqueous solns. We estimated a friction effect for the carbamate

ion which reduces the carbamate ion diffusivity ratio in the cluster channel. For the HN117 membrane case, exptl. results and simulations were in good agreement when we used the diffusivity ratio which was estimated from the group contribution method. The counter ion diffusivities, which are restricted by elec. forces, are the rate limiting step for CO<sub>2</sub> transport through large clusters. For the N117 case, we must consider the friction effect, and when we use a small carbamate diffusivity ratio, stimulations and exptl. results agreed well. The diffusivity of the carbamate ion, which is the largest mol. in the membrane, is the rate limiting step for transport through small cluster channels. This model can explain the permeate-side CO<sub>2</sub> pressure effect as the permeate-side CO<sub>2</sub> pressure seriously reduces the facilitation effect.

L22 ANSWER 17 OF 86 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN

ACCESSION NUMBER: 1996:242077 BIOSIS

DOCUMENT NUMBER: PREV199698790206

TITLE: Phase fluorometric optical **carbon dioxide** gas **sensor** for fermentation off-gas monitoring.



AUTHOR(S): Sipior, Jeffrey; Randers-Eichhorn, Lisa; Lakowicz, Joseph R.; Carter, Gary M.; Rao, Govind [Reprint author]  
 CORPORATE SOURCE: Med. Biotechnol. Cent. Maryland Biotechnol. Inst., Univ. Maryland, Baltimore, MD 20201, USA  
 SOURCE: Biotechnology Progress, (1996) Vol. 12, No. 2, pp. 266-271. CODEN: BIPRET. ISSN: 8756-7938.  
 DOCUMENT TYPE: Article  
 LANGUAGE: English  
 ENTRY DATE: Entered STN: 28 May 1996  
 Last Updated on STN: 11 Jul 1996

AB We demonstrated an optical **carbon dioxide** gas **sensor** suitable for replacement of gas chromatographs and mass spectrometers for the measurement of carbon dioxide in the off-gas of a bioreactor for fermentation and cell culture applications. The sensor is based upon the change in lifetime of a donor fluorophore, sulforhodamine 101 (SR101), induced by fluorescence resonance energy transfer to a pH-sensitive, nonfluorescent acceptor, m-cresol purple (MCP). **Carbon dioxide** diffusing into the **sensor** produces carbonic acid, changing the absorbance spectrum of the MCP, and thus its spectral overlap with the SR101, changing its lifetime. This lifetime change was measured in the frequency, rather than the time domain, as a change in the phase angle of the fluorescence relative to the modulated excitation light. The sensor was calibrated by correlating the phase response to carbon dioxide concentrations. The calibration remained valid over the life of the sensor, which has been shown to be greater than 2 weeks. The sensor was most sensitive at low CO<sub>2</sub> concentrations and responded to concentration changes in seconds. The sensor film is very inexpensive to produce and the light source is an inexpensive light-emitting diode. Furthermore, lower cost detection electronics can be developed since only one modulation frequency is required. In addition, this sensor can potentially be used in vivo, with a fiber optic both delivering the excitation light and collecting the emission.

L22 ANSWER 18 OF 86 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN  
 ACCESSION NUMBER: 96:55665 SCISEARCH  
 THE GENUINE ARTICLE: TN244  
 TITLE: ENHANCED SERUM CARBON-DIOXIDE MEASUREMENTS WITH A SILICONE RUBBER-BASED CARBONATE ION-SELECTIVE ELECTRODE AND A HIGH-PH DILUTION BUFFER  
 AUTHOR: SHIN J H; SAKONG D S; NAM H Y; CHA G S (Reprint)  
 CORPORATE SOURCE: KWANGWOON UNIV, DEPT CHEM, NOWON KU, 447-1 WOLGYE DONG, SEOUL 139701, SOUTH KOREA (Reprint); KWANGWOON UNIV, DEPT CHEM, NOWON KU, SEOUL 139701, SOUTH KOREA; KWANGWOON UNIV, BASIC SCI RES INST, NOWON KU, SEOUL 139701, SOUTH KOREA  
 COUNTRY OF AUTHOR: SOUTH KOREA  
 SOURCE: ANALYTICAL CHEMISTRY, (01 JAN 1996) Vol. 68, No. 1, pp. 221-225. ISSN: 0003-2700.  
 DOCUMENT TYPE: Article; Journal  
 FILE SEGMENT: PHYS; LIFE  
 LANGUAGE: ENGLISH  
 REFERENCE COUNT: 19

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB A new silicone rubber matrix carbonate-selective membrane and a high-ph buffer diluent are used to enhance the performance of the electrode **measurements** for serum **carbon dioxide**. The proposed **membrane** employs one-component silicone rubber as the matrix and trifluoro-acetyl-p-decylbenzene as the neutral ionophore. The optimized membrane formulation incorporates as high as 21.9 wt %

plasticizer (e.g., bis(2-ethylhexyl) adipate). The highly plasticized silicone rubber membranes not only function equivalently, in terms of the carbonate response, to the conventional PVC matrix membranes, but they also exhibit substantially reduced interfering response toward salicylate. Furthermore, the silicone rubber membrane exhibits better adhesion to the solid surface than do PVC or PU membranes. The use of higher pH buffers (e.g., 2-amino-2-methyl-1-propanol (AMP)-H<sub>2</sub>SO<sub>4</sub>, pH 9.5-10.5) further enhances the selectivity of the carbonate electrode measurement system for total CO<sub>2</sub> species over other anions. It is shown that the combined use of the silicone rubber matrix membrane and the high-pH AMP buffer provides a carbonate sensor system that is substantially less subject to interference from salicylate and chloride than is the conventional measurement system employing the PVC-based electrode with the lower pH (8.4-8.8) buffer diluent.

L22 ANSWER 19 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1996:19749 HCAPLUS  
 DOCUMENT NUMBER: 124:81737  
 TITLE: A global signal transduction system regulates aerobic and anaerobic CO<sub>2</sub> fixation in *Rhodobacter sphaeroides*  
 AUTHOR(S): Qian, Yilei; Tabita, F. Robert  
 CORPORATE SOURCE: Dep. Microbiol., Ohio State Univ., Columbus, OH, 43210-1292, USA  
 SOURCE: Journal of Bacteriology (1996), 178(1), 12-18  
 CODEN: JOBAAY; ISSN: 0021-9193  
 PUBLISHER: American Society for Microbiology  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB Complementation of a mutant of *Rhodobacter sphaeroides* defective in photosynthetic CO<sub>2</sub> reduction led to the identification of a gene which encodes a protein that is related to a class of sensor kinases involved in the **bacterial** signal transduction. The nucleotide sequence and deduced amino acid sequence led to the finding that the gene which complemented the mutant is the *regB* (*prdB*) gene, previously isolated from both *R. sphaeroides* and *R. capsulatus* and shown to regulate the anaerobic expression of structural genes required for the synthesis of the reaction center and light-harvesting systems of these organisms. The current investigations is intimately involved in the pos. regulation of the *ccbI* and *ccbII* Calvin cycle CO<sub>2</sub> fixation operons. In addition to regulating the expression of structural genes encoding enzymes of the primary pathway for CO<sub>2</sub> fixation in *R. sphaeroides*, *regB* was also found to be required for the expression of a gene(s) important for the putative alternative CO<sub>2</sub> fixation pathway(s) of this organism. A mutation in *regB* also blocked expression of structural genes of the *ccb* regulon in a strain of *R. sphaeroides* capable of aerobic CO<sub>2</sub>-dependent growth in the dark. It is thus apparent that *regB* is part of a two-component system and encodes a sensor kinase involved in the global regulation of both anoxygenic light-dependent- and oxygenic light-independent CO<sub>2</sub> fixation as well as anoxygenic photosystem biosynthesis.

L22 ANSWER 20 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 6

ACCESSION NUMBER: 1995:780437 HCAPLUS  
 DOCUMENT NUMBER: 123:164648  
 TITLE: **Microbial** optical sensors and methods  
 INVENTOR(S): Wolfbeis, Otto S.; Klainer, Stanley M.  
 PATENT ASSIGNEE(S): FCI-Fiberchem, USA  
 SOURCE: PCT Int. Appl., 24 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent

LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9516052	A1	19950615	WO 1994-US14006	19941206

W: CA, JP, KR

RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE

PRIORITY APPLN. INFO.: US 1993-163040 19931206

AB A method and apparatus for measuring a variety of analytes is based on a biol. cell culture, e.g., yeast, **bacteria** or combinations thereof, and an optical chemical sensor with a species-sensitive indicator. Oxygen and **carbon dioxide** chemical **sensors** using yeast and *Methylomonas flagellata*, resp., are examples of sensors for measuring BOD and methane. The yeast metabolizes organic matter in a sample and consumes oxygen. The decrease in oxygen produces a measurable increase in signal from the oxygen detector by suppression of quenching of fluorescence of the oxygen sensitive indicator. The signal from the oxygen sensor can be used for quantifying BOD. The *M. flagellata* reacts with methane to yield CO<sub>2</sub> which is measured by the **carbon dioxide sensor**. The signal from the **carbon dioxide sensor** can be related to methane concentration

L22 ANSWER 21 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1996:62972 HCAPLUS

DOCUMENT NUMBER: 124:126637

TITLE: A compact seawater pCO<sub>2</sub> measurement system with membrane equilibrator and nondispersive infrared gas analyzer

AUTHOR(S): Saito, Hiroshi; Tamura, Nobuya; Kitano, Hiroshi; Mito, Akihiro; Takahashi, Chiharu; Suzuki, Atsushi; Kayanne, Hajime

CORPORATE SOURCE: Thermophys. Metrology Dep., Natl. Res. Lab., Tsukuba, 305, Japan

SOURCE: Deep-Sea Research, Part I: Oceanographic Research Papers (1995), 42(11/12), 2025-33  
 CODEN: DRORE7; ISSN: 0967-0637

PUBLISHER: Elsevier

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A compact measurement system for partial pressure of CO<sub>2</sub> in seawater (pCO<sub>2</sub>) with a membrane tube and a nondispersive IR gas analyzer (NDIR) was developed. Gaseous CO<sub>2</sub> in seawater diffuses through the membrane into flowing air inside the tube, and the concentration of CO<sub>2</sub> in the air measured by NDIR. Equilibrium between the water and the air is achieved with a time constant of 2 min. PCO<sub>2</sub> changes in seawater are monitored automatically and continuously with an uncertainty of  $\pm 5$   $\mu$ atmospheric. Since the membrane equilibrator can be deployed directly in seawater, the system is small and requires only a small power supply. The system has wide application, not only in coastal zones but also in the open ocean or in incubators.

L22 ANSWER 22 OF 86 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN

ACCESSION NUMBER: 1995:297455 BIOSIS

DOCUMENT NUMBER: PREV199598311755

TITLE: A fiber-optic **carbon dioxide sensor** for fermentation monitoring.

AUTHOR(S): Uttamlal, Mahesh; Walt, David R. [Reprint author]  
 CORPORATE SOURCE: Max Tishler Lab. Org. Chem., Dep. Chem., Tufts Univ., 62  
 Talbot Ave., Medford, MA 02155, USA  
 SOURCE: Bio-Technology (New York), (1995) Vol. 13, No. 6, pp.  
 597-601.  
 CODEN: BTCHDA. ISSN: 0733-222X.  
 DOCUMENT TYPE: Article  
 LANGUAGE: English  
 ENTRY DATE: Entered STN: 11 Jul 1995  
 Last Updated on STN: 11 Jul 1995

AB We have developed a fiber-optic chemical **sensor** for determining dissolved **carbon dioxide** and assessed its performance for the on-line monitoring of fermentation. The sensor operates on the Severinghaus pCO<sub>2</sub> electrode principle; it consists of a pH sensitive dye (hydroxypyrenetrissulfonic acid, HPTS) in an HCO<sub>3</sub><sup>-</sup> buffer solution entrapped in an expanded PTFE support held at the distal end of an optical fiber by a gas permeable membrane. CO<sub>2</sub> crossing the membrane produces a pH change in the indicator solution. This change is related to the external CO<sub>2</sub> concentration by the Henderson-Hasselbach equation. The sensor has a reversible working dissolved CO<sub>2</sub> dynamic range of 0-0.25 atmospheric. The sensor can be auto-claved without affecting its calibration. Results are presented for the on-line determination of CO<sub>2</sub> production in beer fermentation.

L22 ANSWER 23 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1995:504576 HCAPLUS  
 DOCUMENT NUMBER: 122:264034  
 TITLE: **Microbial** and sensory quality of vegetables  
 for soup packaged in different atmospheres  
 AUTHOR(S): Manzano, Marisa; Citterio, Barbara; Maifreni, Michela;  
 Paganessi, Mario; Comi, Giuseppe  
 CORPORATE SOURCE: Dep. Food Sci., Fac. Agraria, Univ. Udine, Udine,  
 33100, Italy  
 SOURCE: Journal of the Science of Food and Agriculture (1995),  
 67(4), 521-9  
 CODEN: JSFAAE; ISSN: 0022-5142  
 PUBLISHER: Wiley  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB Fresh prepacked vegetables for soup have become very popular on the Italian market, since they are already peeled, cut, washed and ready-to-use. The packaging and the modified atmospheric can prolong their shelf-life and maintain their hygienic, physicochem. and sensory characteristics during storage at +4°C. The hygienic and sensory quality was evaluated by analyzing **microbial** growth and atmospheric composition at the moment of packaging and at the end or the shelf-life of vegetables prepacked in air or under modified atmospheres, and by determining the browning or blackening of parsley and the loss of carrot exudates. A large number of different groups of microorganisms was found in raw vegetables. In spite of this high starting concentration of **microbial** flora, the prepackaging systems investigated did not seem to significantly influence their growth during vegetable storage at +4°C. No pathogenic microorganisms were isolated from the prepackaged vegetables. The hygienic quality was similar in all packaging systems used. However, the vegetables packaged in perforated film kept their sensory characteristics better than those packaged in air or under a modified atmospheric

L22 ANSWER 24 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1995:541280 HCAPLUS  
DOCUMENT NUMBER: 123:226428  
TITLE: Preservation of raw milk with **carbon dioxide**. Sensory evaluation of heat-processed milks  
AUTHOR(S): Amigo, Lourdes; Olano, Agustin; Calvo, Marta M.  
CORPORATE SOURCE: Inst. Fermentaciones Industriales, CSIC, Madrid, E-28006, Spain  
SOURCE: Zeitschrift fuer Lebensmittel-Untersuchung und -Forschung (1995), 200(4), 293-6  
CODEN: ZLUFAR; ISSN: 0044-3026  
PUBLISHER: Springer  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB The effect of CO<sub>2</sub> on the growth of psychrotrophic milk spoilage organisms was studied, both in raw fresh milk and in pure cultures of 3 species of *Pseudomonas* growing in sterilized milk. Changes of sensory properties of CO<sub>2</sub>-treated samples after heat treatment were also analyzed. Inhibition of psychrotrophic growth at 7° in milk treated with CO<sub>2</sub> to a pH 6.2 or 6.0 was impaired by a gradual reduction of the CO<sub>2</sub> content during storage. Growth inhibition was considerably improved by pH adjustment at 24 h intervals. Sensory anal. showed significant differences between nonacidified and acidified samples after heat treatment at 75° of 20 s or 110° for 5 min. No sensory differences were found between nonacidified and acidified milks degassed before heat treatment.

L22 ANSWER 25 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 1998:145255 HCAPLUS  
DOCUMENT NUMBER: 128:229447  
TITLE: Optical sensor techniques and applications  
AUTHOR(S): Wolfbeis, Otto S.  
CORPORATE SOURCE: Institute for Organic Chemistry, Karl-Franzens University, Graz, 8010, Austria  
SOURCE: Current Status and Future Trends in Analytical Food Chemistry, Proceedings of the European Conference on Food Chemistry, 8th, Vienna, Sept. 18-20, 1995 (1995), Volume 1, 111-119. Editor(s): Sontag, Gerhard; Pfannhauser, Werner. Austrian Chemical Society: Vienna, Austria.  
CODEN: 65SOA5  
DOCUMENT TYPE: Conference; General Review  
LANGUAGE: English  
AB A review with 26 refs. discussing the design and performance of optical **sensors** for pH, oxygen, **carbon dioxide**, ammonia and ammonium ion, and how these can be combined with certain enzymes to form resp. biosensors. Both the chemical sensors and the biosensors have applications in food quality control, in the detection of **bacterial** contamination, and in food processing. Optical fiber sensors are considered to be particularly useful because they enable invasive methods of anal. However, flow-through systems and flow-injection methods offer attractive advantages, while conventional optical tests are employed in formats such as (a) cuvet tests, (b) tests performed in vials with a sensor chemical placed on the inside and interrogated through the glass wall (without however the risks associated with other tests where vials have to be opened), and (c) in tests strips.  
REFERENCE COUNT: 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L22 ANSWER 26 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 7

ACCESSION NUMBER: 1995:643905 HCAPLUS  
 DOCUMENT NUMBER: 123:85225  
 TITLE: Properties of a polyimide gas separation membrane in natural gas streams  
 AUTHOR(S): White, Lloyd S.; Blinka, Thomas A.; Kloczewski, Harold A.; Wang, I-fan  
 CORPORATE SOURCE: W.R. Grace and Co.-Conn., Washington Research Center, 7379 Route 32, Columbia, MD, 21044, USA  
 SOURCE: Journal of Membrane Science (1995), 103(1-2), 73-82  
 CODEN: JMESDO; ISSN: 0376-7388  
 PUBLISHER: Elsevier  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB **Carbon dioxide** and methane permeabilities were **measured** for dense film and asym. **membrane** prepared from an aromatic polyimide (6FDA/DMB). Selectivities for CO<sub>2</sub>/CH<sub>4</sub> ≤ 55 were determined for mixts. of these gases. Permeability of gases through the membrane was dependent upon the CO<sub>2</sub> and higher hydrocarbon concns. that can also be present in natural gas streams. In addition to CO<sub>2</sub> having an impact on CH<sub>4</sub> permeability, the presence of hexane or toluene cut CO<sub>2</sub>/CH<sub>4</sub> selectivities in half. Lowered selectivities from ideal test conditions are a result of plasticization of the polyimide by these components. Results for the polyimide are contrasted with values obtained from cellulose acetate films which are less impacted by hydrocarbon impurities. The polyimide depends more upon diffusivity factors than cellulose acetate to generate high selectivity. Thermal and phys. properties of 6FDA/DMB polymer and membrane are also described.

L22 ANSWER 27 OF 86 WPIDS COPYRIGHT 2004 THOMSON DERWENT on STN

ACCESSION NUMBER: 1994-346180 [43] WPIDS

DOC. NO. CPI: C1994-157176

TITLE: Starting temperature control for Koji growing facility - based on filling of culture media in environmentally controlled growing room.

DERWENT CLASS: D16

PATENT ASSIGNEE(S): (MISU) MITSUBISHI NOKI KK

COUNTRY COUNT: 1

PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
JP 06269280	A	19940927	(199443)*		6

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
JP 06269280	A	JP 1993-86802	19930321

PRIORITY APPLN. INFO: JP 1993-86802 19930321

AN 1994-346180 [43] WPIDS

AB JP 06269280 A UPAB: 19941216

A container (2) filled with a culture medium is placed in an environmentally controlled Koji raising room (1) and control of item temperature is started when the filling of culture media is finished. The control starting operation is cancelled automatically when the filling of a culture medium is not completed or when an item temperature sensor is not

operating correctly.

USE/ADVANTAGE - Mistakes for controlling the room temperature while expecting to control the item temperature, are avoided.

In an example, a Koji growing equipment housed in a Koji growing room (1), whose environmental conditions are controlled by a controller (8) (a host computer), which performs a programmed control, is composed of a filler (3) for filling culture media such as steamed rice with grown Koji **fungus** in flat containers (2) one by one, a rotating unit (4) for changing stacking order, and a stirrer (6) for stirring culture media to make the fermentation condition uniform within a container (2). The rotating unit (4) changes the stacking order of, or rotates position of, a number of containers (2) to unify the fermentation conditions such as the temperature, the humidity, and the carbon dioxide concentration for each container (2) which is a rectangular wooden case. The sensors, which are connected to the controller (8), used for the inside environmental conditioning of the room (1) are a thermometer (9), a hygrometer (11), a densitometer (12) for measuring sampled **carbon dioxide** gas, and temperature **sensors** (26) for performing sampling measurement of item temperature of moving containers and of the culture medium in the container (2). Temperature sensors (26) are provided by each container (2). The decision for whether culture media being filled in all container (2) or not is made by the controller (8).  
Dwg.1/5

L22 ANSWER 28 OF 86 WPIDS COPYRIGHT 2004 THOMSON DERWENT on STN  
 ACCESSION NUMBER: 1994-296676 [37] WPIDS  
 DOC. NO. NON-CPI: N1994-233313  
 DOC. NO. CPI: C1994-135099  
 TITLE: Household garbage disposal device - comprises sensor to detect gas generated in anaerobic treatment tank and information processor to determine reaction state in tank according to sensor output.  
 DERWENT CLASS: D16 P43  
 PATENT ASSIGNEE(S): (TOKE) TOSHIBA KK  
 COUNTRY COUNT: 1  
 PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
JP 06126267	A	19940510	(199437)*		10

## APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
JP 06126267	A	JP 1992-275732	19921014

PRIORITY APPLN. INFO: JP 1992-275732 19921014

AN 1994-296676 [37] WPIDS

AB JP 06126267 A UPAB: 19941109

Device comprises a gas sensor for detecting a gaseous body generated during the anaerobic treatment in an anaerobic treatment tank and an information processor for determining the reaction state in the anaerobic treatment tank according to outputs from gas sensors.

The gas sensor is composed of a methane sensor such as a tin dioxide semiconductor gas **sensor** for detecting methane and a **carbon dioxide sensor** for measuring

**carbon dioxide** by using infrared rays. The tin dioxide semiconductor gas sensor is sensitive against carbon monoxide and ethanol; however, the principal components of gas generated by the anaerobic treatment are methane and **carbon dioxide**. The gas **sensor** can be placed in an anaerobic treatment tank or in a piping. The ratio of generated carbon dioxide is getting higher as the load increases. The ratio of generated methane and carbon dioxide are more than 70-55% and less than 30-45% respectively when the load to an anaerobic **bacteria** is adequate. When the ratio of methane comes to less than 60-50%, that is the ratio of carbon dioxide is more than 40-50%, the highly concentrated volatile fatty acid in the disposed waste water is detected and it is decided that the bad treatment state exists. An information processor decides the reaction state in the anaerobic treatment tank by using mutual relation between the generating ratio of methane and carbon dioxide and the reacting state of the anaerobic **bacteria**.

USE/ADVANTAGE - Overloading of the device is avoided by controlling the dumping of garbage according to the treatment state and deterioration of the disposed waste water is prevented by decomposing garbage completely.  
Dwg.0/6

L22 ANSWER 29 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 8

ACCESSION NUMBER: 1995:27353 HCAPLUS  
DOCUMENT NUMBER: 122:135139  
TITLE: Transport of oxygen and carbon dioxide through polycarbonate membrane  
AUTHOR(S): Bae, Seong-Youl; Cho, Du-Hyon; Kim, Hee-Taik; Kumazawa, Hidehiro  
CORPORATE SOURCE: Department of Chemical Engineering, Hanyang University, Seoul, 133-791, S. Korea  
SOURCE: Korean Journal of Chemical Engineering (1994), 11(2), 127-30  
CODEN: KJCHE6; ISSN: 0256-1115  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB Sorption equilibrium and permeation rates for oxygen and **carbon dioxide** in polycarbonate **membrane** were **measured** at different temperature between 30 and 60° and at pressures up to 2.5 MPa. The pressure dependence of mean permeability coefficient to oxygen obeyed the conventional dual-mode mobility model, whereas that to carbon dioxide followed a modified dual-mode mobility model with concentration-dependent diffusivities, as that of polystyrene to the same gas did.

L22 ANSWER 30 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1993:577119 HCAPLUS  
DOCUMENT NUMBER: 119:177119  
TITLE: An apparatus for indicating the presence of carbon dioxide, and a method of measuring and indicating **bacterial** activity within a container or **bag**  
INVENTOR(S): Holte, Bo  
PATENT ASSIGNEE(S): Den.  
SOURCE: PCT Int. Appl., 42 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:



PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9315402	A1	19930805	WO 1993-DK40	19930204
W: AT, AU, BR, CA, CH, DE, ES, GB, HU, JP, KR, LU, MG, MN, MW, NL, PL, RU, SD, SE, US				
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, SN, TD, TG				
AU 9334927	A1	19930901	AU 1993-34927	19930204
PRIORITY APPLN. INFO.:			DK 1992-134	19920204
			WO 1993-DK40	19930204

AB The biol. activity within a container or **bag** containing a foodstuff or a human thrombocyte concentrate is monitored by means of an apparatus for indicating the partial pressure of carbon dioxide. The apparatus comprises a first foil of a light-transparent material substantially impermeable to gas and water, a second foil constituting a **carbon dioxide-permeable membrane**, and an **indicator** system contained within a sponge which is enclosed within a chamber defined between the 1st and 2nd foils, resp. As **carbon dioxide permeates** into the chamber, the **indicator** system generates a visible indication in response to exposure to carbon dioxide; the indication is visible through the 1st foil. Diagrams of the apparatus are included. A prototype apparatus using Bromethymol Blue indicator was tested in a blood bank and also used for transcutaneously measuring the partial pressure of carbon dioxide of a test person; the prototype responded correctly when exposed to carbon dioxide.

L22 ANSWER 31 OF 86 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN  
 ACCESSION NUMBER: 94:9701 SCISEARCH  
 THE GENUINE ARTICLE: MN473  
 TITLE: GAS-PERMEABILITY IN AN AROMATIC POLYESTER  
 AUTHOR: ZHANG J (Reprint); SUN Q S; HOU X H  
 CORPORATE SOURCE: ACAD SINICA, INST CHEM, BEIJING 100080, PEOPLES R CHINA (Reprint)  
 COUNTRY OF AUTHOR: PEOPLES REPUBLIC OF CHINA  
 SOURCE: MACROMOLECULES, (20 DEC 1993) Vol. 26, No. 26, pp. 7176-7181.  
 ISSN: 0024-9297.  
 DOCUMENT TYPE: Article; Journal  
 FILE SEGMENT: PHYS  
 LANGUAGE: ENGLISH  
 REFERENCE COUNT: 26

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB A series of copolymers of phenolphthalein with 4,4'-biphenyl dicarbonyl chloride and bis[p-(chlorocarbonyl)phenyl]dimethylsilane were synthesized, and their flexible films were cast readily. The gas transport properties for hydrogen, oxygen, nitrogen, **carbon dioxide**, and methane in **membranes** were **measured** by a low pressure method at 30-degrees-C and 1 atmospheric As the solubility-diffusion process analysis, how the molar content of the silane segment on the polymer backbone affects the behavior of gas transport through an aromatic polyester was studied. It is sure that the packing density is an important factor for determining the gas diffusivity in a polymer. With the increasing molar content of the silane segment, the packing density reduces and the gas diffusivity in the aromatic polyester increases. Contrary to that, gas solubility reduces. Meanwhile, both diffusivity selectivity and solubility selectivity decrease. The result is that gas permeability rises and permselectivity for hydrogen over nitrogen, oxygen

over nitrogen, and carbon dioxide over methane in a membrane of an aromatic polyester reduces with the introduction of a silane segment on the polymer backbone. The correlation between the concentration of the carbonyl group and the gas solubility selectivity is discussed in this paper. At the end, we compare the gas transport properties of those aromatic polyesters with common commercial polymer materials used as the separation membrane.

L22 ANSWER 32 OF 86 EMBASE COPYRIGHT 2004 ELSEVIER INC. ALL RIGHTS RESERVED.  
on STN DUPLICATE 9

ACCESSION NUMBER: 93300320 EMBASE  
DOCUMENT NUMBER: 1993300320  
TITLE: Chemically and mechanically resistant carbon dioxide optrode based on a covalently immobilized pH indicator.  
AUTHOR: Weigl B.H.; Holobar A.; Rodriguez N.V.; Wolfbeis O.S.  
CORPORATE SOURCE: Karl Franzens University Graz, Institute of Organic Chemistry, Analytical Division, Heinrich-Strasse 28,A-8010 Graz, Austria  
SOURCE: Analytica Chimica Acta, (1993) 282/2 (335-343).  
ISSN: 0003-2670 CODEN: ACACAM  
COUNTRY: Netherlands  
DOCUMENT TYPE: Journal; Article  
FILE SEGMENT: 046 Environmental Health and Pollution Control  
052 Toxicology  
LANGUAGE: English  
SUMMARY LANGUAGE: English

AB An optimal chemical sensor for dissolved carbon dioxide has been developed whose dynamic range was adjusted to CO<sub>2</sub> partial pressures ranging from 0 to 100 hPa. The change in the pH of a buffer layer, caused by diffusion of **carbon dioxide** through a hydrophobic **membrane**, is **indicated** by the colour change of a covalently immobilized dye, and monitored through optical fibers. The sensor also incorporates an optical insulation with a resplendent pigment to increase the reflectivity and to reduce adverse effects of straylight and ambient light. Two methods for layer manufacturing (spreading and spin coating) are described. The sensor membrane is fully LED compatible. The optrode shows a promising performance with respect to chemical and mechanical long term stability, reproducibility, and sterilizability.

L22 ANSWER 33 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 10

ACCESSION NUMBER: 1993:466849 HCAPLUS  
DOCUMENT NUMBER: 119:66849  
TITLE: Development and evaluation of optical sensors for the detection of **bacteria**  
AUTHOR(S): Swenson, Frank J.  
CORPORATE SOURCE: AVL Photonics Corp., Roswell, GA, 30076, USA  
SOURCE: Sensors and Actuators, B: Chemical (1993), B11(1-3), 315-21  
CODEN: SABCEB; ISSN: 0925-4005  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB The objective is to develop a system with: (1) culture bottles containing growth media and sterilizable optical sensors and (2) an instrument that would automatically monitor bottles and evaluate each for evidence of **bacterial** growth. CO<sub>2</sub> optical sensors have been chosen for the system, since CO<sub>2</sub> is recognized as a universal byproduct of **bacterial** metabolism. Fluorometric sensors, similar in principle to those described previously for measuring pCO<sub>2</sub> levels in blood, have been developed and optimized. An instrument (AVL BDS-240) has also been

developed. The BDS-240 is a noninvasive automated system for the rapid detection of aerobic and anaerobic **bacteria** as well as some **fungi**. The instrument and bottle system are optimized to detect the presence of **bacteria** and **fungi** in fresh human blood (blood cultures). The instrument is capable of storing a total of 240-culture bottles. The bottles are arranged in six racks, each of which holds up to 40 bottles. Racks are continuously heated at 35°C and are agitated for the maximum recovery of organisms. Samples are drawn from patients and injected directly into the culture bottles. The culture bottle is placed into a rack station. Each station has its own LED/photodiode optical unit. Every ten min LEDs (two racks at a time) illuminate the optical sensors in the bottles and photodetector measurements from each station are stored and evaluated for significant changes. Those bottles that indicate significant rate increases in CO<sub>2</sub> are flagged as pos. In recent clin. evaluation, five hospitals collected approx. 10,000 blood specimens in duplicate and inoculated each specimen into four bottles. Fifty percent of these bottles have been tested by the hospital's existing blood-culture method and the other 50% tested with the AVL BDS-240 system. The clin. trials lasted approx. eight months and the BDS-240 has been found to be equivalent to the hospital's current method with regard to the isolation of relevant microorganisms. However, because of the continuous monitoring capability, microorganisms are detected much faster by the BDS-240. In addition, the AVL system is much less labor intensive than the current methods of the hospitals.

L22 ANSWER 34 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1993:594557 HCAPLUS

DOCUMENT NUMBER: 119:194557

TITLE: A carbon dioxide microelectrode for in situ pCO<sub>2</sub> measurement

AUTHOR(S): Gollany, Hero T.; Schumacher, Thomas E.; Rue, Rolland R.; Liu, Su Yi

CORPORATE SOURCE: Plant Sci. Dep., South Dakota State Univ., Brookings, SD, 57007, USA

SOURCE: Microchemical Journal (1993), 48(1), 42-9  
CODEN: MICJAN; ISSN: 0026-265X

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A microelectrode is described which permits a nondestructive method for measuring pCO<sub>2</sub> in living cells or small samples. The authors' objective was to develop an easily fabricated pCO<sub>2</sub> microelectrode that would permit anal. of small samples and withstand insertion into the soil. A pCO<sub>2</sub> microelectrode was developed by making use of a newly developed micro-pH electrode (MEPH4, WPI) and a semiliquid chlorotrifluoroethylene oil-wax gas permeable membrane. The fabricated microelectrode has a tip diameter of  $\leq 120 \mu\text{m}$  (outer diameter) and a response time of  $\leq 3$  min with a linear (nearly Nernstian) slope ( $58.0 \pm 2 \text{ mV}/\log_{10} \text{pCO}_2$ ). The pCO<sub>2</sub> microelectrode response is independent of the test solution pH and electrolytes. Measurements of pCO<sub>2</sub> with the microelectrode compared favorably with those from a standard pCO<sub>2</sub> macroelectrode (model 95-02, Orion), and the regression line had a slope of 1.2 and  $r = 0.98$ . This microelectrode is simple to fabricate, and the tip diameter is sufficiently small ( $\leq 120 \mu\text{m}$ ) to permit measurement of CO<sub>2</sub> in small sample vols. The first direct potentiometric detns. of rhizosphere (soil-root interface) pCO<sub>2</sub> were carried out to demonstrate the performance of the microelectrode. Rhizoplane ( $< 1 \text{ mm}$  from the root) pCO<sub>2</sub> values at the five leaf stage were higher for Sordan-757 ( $9.14 \pm 0.39$  and  $11.33 \pm 0.28 \text{ kPa}$ ) than for Sordan-333 ( $7.15 \pm 0.57$  and  $9.55 \pm 0.30 \text{ kPa}$ ) on low and high CaCO<sub>3</sub> soils, resp. The pCO<sub>2</sub>

microelectrode is an improved technique for examining the root-soil interface and other biol. microenvironments.

L22 ANSWER 35 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 1992:567173 HCAPLUS  
 DOCUMENT NUMBER: 117:167173  
 TITLE: Measurement of **bacterial** carbon dioxide production in an isolated fluorophore by monitoring an absorbance-regulated change of fluorescence  
 INVENTOR(S): Morris, Roger James; Bascomb, Shoshana; Bobolis, Jamie; Sherman, David  
 PATENT ASSIGNEE(S): Baxter Diagnostics Inc., USA  
 SOURCE: PCT Int. Appl., 25 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9212413	A1	19920723	WO 1991-US9716	19911223
W: AU, CA, JP, KR, NO				
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, MC, NL, SE				
CA 2077560	AA	19920705	CA 1991-2077560	19911223
AU 9212638	A1	19920817	AU 1992-12638	19911223
AU 652423	B2	19940825		
EP 519066	A1	19921223	EP 1992-904836	19911223
R: BE, DE, ES, FR, GB, IT, SE				
JP 05504263	T2	19930708	JP 1992-505272	19911223
NO 9203436	A	19920903	NO 1992-3436	19920903
US 5372784	A	19941213	US 1994-212674	19940311
US 5565328	A	19961015	US 1995-579089	19951227
PRIORITY APPLN. INFO.:			US 1991-638481	19910104
			US 1988-238710	19880831
			US 1990-609278	19901105
			WO 1991-US9716	19911223
			US 1992-895149	19920605
			US 1993-16654	19930209
			US 1993-174613	19931228
			US 1995-431194	19950427

AB Microorganisms are detected in a blood culture bottle through their CO<sub>2</sub> production as measured with a multilayer sensor comprising (a) a pH-sensitive absorbance-based dye (xylenol blue or bromothymol blue) encapsulated in a 1st light-transmissive, gas-permeable, proton-impermeable matrix and (b) a pH-insensitive fluorescent dye (Rhodamine B or Rhodamine 101) in an inert, light-transparent matrix, the 1st and 2nd matrixes being spectrally coupled. The matrixes may be of silicone or acrylic resin. As the CO<sub>2</sub> concentration increases, the absorbance of the dye decreases, thus allowing more light to reach the fluorophore and increasing the intensity of fluorescence emitted.

L22 ANSWER 36 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 1992:439493 HCAPLUS  
 DOCUMENT NUMBER: 117:39493  
 TITLE: Ion-exchange membrane method for determination of carbon dioxide and its application to acid or alkali concentration measurement

INVENTOR(S): Hamamoto, Osamu  
PATENT ASSIGNEE(S): Mitsui Zosen K. K., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 04055757	A2	19920224	JP 1990-166314	19900625
JP 07092452	B4	19951009		

PRIORITY APPLN. INFO.: JP 1990-166314 19900625

AB A gas containing CO<sub>2</sub> is contacted with a CO<sub>2</sub>-absorbing liquid associated with an intermediate anion-exchange membrane, then the volume loss of the gas is measured to determine the CO<sub>2</sub>, and the method is applied on (1) alkali determination, in which CO<sub>2</sub> is contacted with aqueous alkali associated with an intermediate anion-exchange membrane and the resulting absorbed CO<sub>2</sub> is measured, and on (2) acid determination, in which aqueous acid is contacted with a CO<sub>2</sub>-discharging liquid associated with an intermediate ion-exchange membrane and the resulting discharged CO<sub>2</sub> is measured. The accuracy is improved in the method using the ion-exchange membrane, which prevents the determination from absorbing or discharging of extra matters.

L22 ANSWER 37 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1992:268073 HCAPLUS  
DOCUMENT NUMBER: 116:268073  
TITLE: Novel thin optical film sensors for the detection of carbon dioxide  
AUTHOR(S): McMurray, H. Neil  
CORPORATE SOURCE: Chem. Dep., Univ. Coll. Swansea, Swansea, SA2 8PP, UK  
SOURCE: Journal of Materials Chemistry (1992), 2(4), 401-6  
CODEN: JMACEP; ISSN: 0959-9428  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB New materials are described which enable the indirect optical sensing of carbon dioxide using visible light. These materials, consisting of plasticized polymers in which are dissolved organosol. salts of acid-base indicator dyes, act as completely reversible and non-consumptive sensors. They may be produced in the form of thin, transparent films, the absorbance of which is strongly influenced by carbon dioxide. These films are completely insol. in water and contain no volatile component; consequently, they function over a wide range of temperature and relative humidity. The time-dependent and time-independent responses to carbon dioxide of example films are described and factors which influence the response time and stability of the sensor materials are examined and discussed. A mechanism is proposed to explain the responsiveness to carbon dioxide of the indicator dyes in a substantially non-aqueous medium. Sensors may be fabricated which combine subsecond response times with storage lifetimes in excess of 1 yr.

L22 ANSWER 38 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 11

ACCESSION NUMBER: 1994:215367 HCAPLUS  
DOCUMENT NUMBER: 120:215367  
TITLE: Microbial electrode for glutamic acid

AUTHOR(S): Zhang, Meifen; Xie, Jinyun; Sheng, Guoli; Cai, Longju; Yu, Ruqin  
 CORPORATE SOURCE: Dep. Biol., Hunan Normal Univ., Peop. Rep. China  
 SOURCE: Hunan Shifan Daxue Ziran Kexue Xuebao (1992), 15(4), 353-7

CODEN: HSDXEL; ISSN: 1000-2537

DOCUMENT TYPE: Journal

LANGUAGE: Chinese

AB **Microbial** electrodes for glutamate have been made by the coupling of **bacterial** membrane and **carbon dioxide** gas-sensor; the **bacterial** membrane is made when Escherichia coli is cross-linked with sepharose-glutaraldehyde. Calibration plots of  $\Delta E/\Delta t$  measurements vs. glutamic acid concentration (mg/L) are linear in the range 100.apprx.1200 mg/L. The optimum

pH is found to be 3.8.apprx.5.6. The optimum temperature is 30°C. The Michaelis constant of the enzyme reaction is  $6.8 \times 10^{-3}$  mol/L. The **microbial** electrode has been applied to the determination of monosodium glutamate in gourmet powder and of glutamic acid in fermentation broth; the results agree with Warburg method. The electrode is suited for the fast anal. of glutamic acid in fermentation broth.

L22 ANSWER 39 OF 86 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN

ACCESSION NUMBER: 1993:136851 BIOSIS

DOCUMENT NUMBER: PREV199395069651

TITLE: Biosensor for L-lysine based on **carbon dioxide** pressure **sensor** of conductometric type.

AUTHOR(S): Ignatov, S. G. [Reprint author]; Andreev, S. N.; Dragunova, S. F.

CORPORATE SOURCE: All-Union Res. Inst. Appl. Microbiol., Obolensk, Russia

SOURCE: Biotekhnologiya, (1992) Vol. 0, No. 6, pp. 63-64.

CODEN: BTKNEZ. ISSN: 0234-2758.

DOCUMENT TYPE: Article

LANGUAGE: Russian

ENTRY DATE: Entered STN: 16 Mar 1993

Last Updated on STN: 17 Mar 1993

AB The L-lysine biosensor was created which consists from L-lysine decarboxylase immobilized on membrane filter and located at electrode with the use of dialysis membrane. pH and temperature optimum values were determined (6.0 and 37 degree respectively). A linear dependence of response strictly specific for lysine within the concentration interval 0.4-8 mM was shown. A possibility in principle of chlorophos determination using the sensor indicated was established.

L22 ANSWER 40 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1991:647069 HCAPLUS

DOCUMENT NUMBER: 115:247069

TITLE: Two-layer membrane probe for determination of gases and nonionic compounds contained in a sample medium

INVENTOR(S): Bucher, Rene M.; Wernli, Susanne; Baumann, Andreas M.

PATENT ASSIGNEE(S): Ingold Messtechnik A.-G., Switz.

SOURCE: Patentschrift (Switz.), 8 pp.

CODEN: SWXXAS

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CH 677151	A	19910415	CH 1988-2503	19880630
PRIORITY APPLN. INFO.:			CH 1988-2503	19880630

AB This measuring probe has a 2-layer membrane with a high deformation resistance. The membrane is subjected to large pressure differences upon entering the sample medium, and the pressure produces no deformation in the inner chamber of the probe. Resistance to chemical and mech. effects is high and there is no contamination by sample-medium components and/or **bacterial** growth. The probes inner chamber is hermetically sealed, such that a material exchange with the sample medium results exclusively through the membrane. This measuring probe has a modular design and has application in determining O2 and CO2. The layers may be PTFE and silicone rubber.

L22 ANSWER 41 OF 86 WPIDS COPYRIGHT 2004 THOMSON DERWENT on STN

ACCESSION NUMBER: 1991-368592 [50] WPIDS

CROSS REFERENCE: 1993-008588 [01]; 1993-336080 [42]

DOC. NO. NON-CPI: N1991-282240

DOC. NO. CPI: C1991-158829

TITLE: Measuring low carbon di oxide levels in a water sample - using two membrane separating in cascade, one having a weak base and the other strong base, and measuring conductivity.

DERWENT CLASS: D15 E36 J04 S03 X11

INVENTOR(S): CONNOLLY, D J

PATENT ASSIGNEE(S): (BABW) BABCOCK & WILCOX CO

COUNTRY COUNT: 1

PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
US 5068090	A	19911126	(199150)*		

## APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
US 5068090	A	US 1990-499142	19900326

PRIORITY APPLN. INFO: US 1990-499142 19900326

AN 1991-368592 [50] WPIDS

CR 1993-008588 [01]; 1993-336080 [42]

AB US 5068090 A UPAB: 19931202

Water sample is passed through a device for exchanging cations for hydrogen in the sample stream which then passes to a first membrane separator (10) where a weak base (24) neutralises strong acids in the sample, to leave carbonic acid in the sample unreacted, before passing to a second membrane separator (12) where a strong base (24) converts carbonic acid in the sample stream to a carbonate salt. Conductivity of the sample stream is measured (30,38) both at the output (32) of the first membrane separator and at the output (36) of the second **membrane** separator (12) and the two **measurements** used to calculate the **carbon dioxide** concentration in the sample from changes in the conductivity.

USE/ADVANTAGE - Partic. in monitoring power plant water chemistry. Prior methods involved degassed conductivity measurements where the degassing was performed by boiling off CO2. However the boiling also boils

off other anions; and cooling, or compensation for measurements made at high temps., can lead to errors. By employing transmembrane ion exchange techniques measurements are performed quickly and accurately. @ (13pp Dwg.No.1/7)

L22 ANSWER 42 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 12  
 ACCESSION NUMBER: 1992:5289 HCAPLUS  
 DOCUMENT NUMBER: 116:5289  
 TITLE: Estimation of dissolved carbon dioxide concentrations in aerobic fermentations  
 AUTHOR(S): Royce, Patrick N. C.; Thornhill, Nina F.  
 CORPORATE SOURCE: SERC Cent. Biochem. Eng., Univ. Coll. London, London, WC1E 7JE, UK  
 SOURCE: AIChE Journal (1991), 37(11), 1680-6  
 CODEN: AICEAC; ISSN: 0001-1541  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB Dissolved carbon dioxide and bicarbonate ions in fermentation broths can (independently) inhibit or promote **microbial** growth and productivity. In research facilities with a large number of fermenters, dissolved **carbon dioxide sensors** tend not to be used, and as a result this variable will generally go unmonitored, making the meaningful anal. of data more difficult. For aerobic fermns., mass transfer of carbon dioxide can be described in an analogous way to oxygen transfer. The mass transfer coefficient for carbon dioxide is 0.89 times that for oxygen. The maximum dissolved carbon dioxide concentration as a function of exit gas composition is compared with the concentration obtained by assuming equilibrium between the broth and exit gas. The difference between these two concns. is typically 20-40% of the equilibrium concentration In large fermenters, a degree of plug flow behavior in the gas and the generally lower specific aeration rates will serve to produce a better approach to equilibrium than for research fermenters.

L22 ANSWER 43 OF 86 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN  
 ACCESSION NUMBER: 91:30346 SCISEARCH  
 THE GENUINE ARTICLE: EQ754  
 TITLE: PERMEATION OF DISSOLVED CARBON-DIOXIDE IN SYNTHETIC MEMBRANES  
 AUTHOR: NAKAGAWA T (Reprint); NARUSE A; HIGUCHI A  
 CORPORATE SOURCE: MEIJI UNIV, DEPT. IND CHEM, 1-1-1 HIGASHI MITA, TAMA KU, KAWASAKI, KANAGAWA 214, JAPAN (Reprint)  
 COUNTRY OF AUTHOR: JAPAN  
 SOURCE: JOURNAL OF APPLIED POLYMER SCIENCE, (1991) Vol. 42, No. 2, pp. 383-389.  
 DOCUMENT TYPE: Article; Journal  
 FILE SEGMENT: PHYS; ENGI  
 LANGUAGE: ENGLISH  
 REFERENCE COUNT: 18

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Permeability coefficients of dissolved carbon dioxide in poly (dimethyl siloxane), plasma-treated poly (dimethyl siloxane) **membranes**, and other **membranes** were **measured** by applying a **carbon dioxide** electrode in a liquid to liquid diffusion cell. The apparent permeability coefficients of carbon dioxide polystyrene, low density polyethylene, and nylon membranes in a liquid phase were observed to be higher than those in a gas phase due to a plasticizing effect of water molecules in the membranes. Boundary layer's resistance was estimated for plasma-treated and nontreated poly (dimethyl



siloxane) membranes. The plasma treatment (10 W for 1 min in this study) which makes hydrophilic surfaces without change of bulk polymer properties was found to be effective to decrease the boundary layer's thickness and to increase the apparent permeability coefficient in the liquid phase.

L22 ANSWER 44 OF 86 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN

ACCESSION NUMBER: 1991:477476 BIOSIS  
DOCUMENT NUMBER: PREV199192111236; BA92:111236  
TITLE: EFFECTS OF GAS ATMOSPHERE STORAGE TEMPERATURE AND STORAGE TIME ON THE SHELF LIFE AND SENSORY ATTRIBUTES OF VACUUM PACKAGED GROUND BEEF PATTIES.  
AUTHOR(S): BENTLEY D S [Reprint author]; REAGAN J O; MILLER M F  
CORPORATE SOURCE: UNIV GA, DEP ANIMAL DAIRY SCI, ATHENS, GA 30602, USA  
SOURCE: Journal of Food Science, (1991) Vol. 54, No. 2, pp. 284-286.  
CODEN: JFDSA2. ISSN: 0022-1147.  
DOCUMENT TYPE: Article  
FILE SEGMENT: BA  
LANGUAGE: ENGLISH  
ENTRY DATE: Entered STN: 26 Oct 1991  
Last Updated on STN: 26 Oct 1991

AB The effects of modified atmosphere packaging systems on the shelf life and palatability attributes of ground beef patties were determined. Packaging systems evaluated were 100% nitrogen backflush, 100% carbon dioxide backflush and no gas backflush (no oxygen). Vacuum-packaged samples were stored at 0, 4 and 8° C for 7, 14, and 21 days. Percent purge increased as storage temperature increased and as time in storage increased (up to 14 days of storage). Nitrogen backflush produced the lowest purge values; vacuum packaged controls had the highest levels. Kramer shear values and **microbial** counts increased with time in storage. ~~Sensory traits indicated that the carbon~~  
**dioxide** treatment yielded higher taste panel scores. Sensory panel values decreased with time in storage.

L22 ANSWER 45 OF 86 EMBASE COPYRIGHT 2004 ELSEVIER INC. ALL RIGHTS RESERVED. on STN

ACCESSION NUMBER: 92024541 EMBASE  
DOCUMENT NUMBER: 1992024541  
TITLE: Luminescence chemical sensors for biomedical applications: Scope and limitations.  
AUTHOR: Leiner M.J.P.  
CORPORATE SOURCE: AVL List GmbH, Biomedical Research and Development, Kleistrasse 48, A-8020 Graz, Austria  
SOURCE: Analytica Chimica Acta, (1991) 255/2 (209-222).  
ISSN: 0003-2670 CODEN: ACACAM  
COUNTRY: Netherlands  
DOCUMENT TYPE: Journal; Conference Article  
FILE SEGMENT: 027 Biophysics, Bioengineering and Medical Instrumentation  
029 Clinical Biochemistry  
LANGUAGE: English  
SUMMARY LANGUAGE: English

AB A great variety of fluorescence-based sensors, sensitive to heat, ions, enzyme substrates and gases, are known. Fluorescence-based measurement systems have been developed for in vitro and in vivo monitoring of blood gases. Optical pH **sensors** have been used for monitoring **carbon dioxide** through induced changes of pH. Oxygen fluorescence sensors have been based on intensity measurements and on measurements of fluorescence lifetime. Enzymatically selective layers use

oxygen or pH sensors as transducers. Fluorescence-based sensors for sensing ionic species have also been investigated. The basic technology, performance characteristics and design parameters of specific optical sensors are discussed. Examples illustrate the current limitations of fluorescence-based optical sensors, especially when used for biomedical applications.

L22 ANSWER 46 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1992:476084 HCAPLUS

DOCUMENT NUMBER: 117:76084

TITLE: Advances in the use of **membrane** technology for the on-line **measurements** of dissolved **carbon dioxide** at the  $\mu\text{gkg}^{-1}$  level in ultra pure water

AUTHOR(S): Maughan, Eric V.; Gericke, Gerhard; Lok, Gerrit W.

CORPORATE SOURCE: Krohne (Pty) Ltd., Halfway House, S. Afr.

SOURCE: Official Proceedings - International Water Conference (1991), 52nd, 199-204  
CODEN: OIWCEQ; ISSN: 0739-4977

DOCUMENT TYPE: Journal

LANGUAGE: English

AB From the results obtained to date, the feasibility of a single-loop continuous online analyzer for dissolved CO<sub>2</sub> at  $\mu\text{g/kg}$  levels has been shown. Use is made of the transfer of a gas across a membrane and is enhanced by the employment of a vacuum across the membrane. Knowing the pH of the sample at the membrane, the ratio between free CO<sub>2</sub> and total CO<sub>2</sub> (as HCO<sub>3</sub><sup>-</sup>) can be determined from the equilibrium consts. The KROHNE CO<sub>2</sub>-2000 analyzer provides a rapid means for the determination of dissolved CO<sub>2</sub> in steam-condensate.

L22 ANSWER 47 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 13

ACCESSION NUMBER: 1991:446303 HCAPLUS

DOCUMENT NUMBER: 115:46303

TITLE: Formate releases **carbon dioxide** /bicarbonate from thylakoid **membranes**: **measurements** by mass spectroscopy and infrared gas analyzer

AUTHOR(S): Govindjee; Weger, H. G.; Turpin, D. H.; Van Rensen, J. J. S.; De Vos, O. J.; Snel, J. F. H.

CORPORATE SOURCE: Dep. Physiol., Univ. Illinois, Urbana, IL, 61801-3793, USA

SOURCE: Naturwissenschaften (1991), 78(4), 168-70  
CODEN: NATWAY; ISSN: 0028-1042

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Bicarbonate has been suggested to regulate photosystem II (PS II) electron flow under a variety of conditions. A. Stemler (1989) reported that formate addition, which caused drastic inhibition of electron flow in maize thylakoids at pH 6, did not result in CO<sub>2</sub> release. This challenged the hypothesis that formate inhibition of photosynthetic electron transport functions by displacing bicarbonate. This report describes the use of 2 independent methods, a sensitive membrane inlet mass spectrometer and a sensitive differential gas flow analyzer, to show that formate treatment releases micromolar quantities of CO<sub>2</sub> from spinach and pea membranes. This CO<sub>2</sub> release is pH dependent and occurs within min of formate treatment. At pH 6.5, about 10  $\mu\text{M}$  (1 CO<sub>2</sub>/reaction center II) and at pH 6 about 4  $\mu\text{M}$  CO<sub>2</sub> are released with a half-time in the range of 1 to 5 min. These results are thus consistent with the hypothesis that native-bound bicarbonate is released from thylakoid membranes upon binding

by formate.

L22 ANSWER 48 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 14

ACCESSION NUMBER: 1991:602498 HCAPLUS  
 DOCUMENT NUMBER: 115:202498  
 TITLE: Disposable amperometric **carbon dioxide sensor** employing **bacteria** and a miniature oxygen electrode  
 AUTHOR(S): Suzuki, Hiroaki; Tamiya, Eiichi; Karube, Isao  
 CORPORATE SOURCE: Fujitsu Lab., Ltd., Atsugi, 243-01, Japan  
 SOURCE: Electroanalysis (1991), 3(1), 53-7  
 CODEN: ELANEU; ISSN: 1040-0397  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB A disposable **bacterial** CO<sub>2</sub> sensor employs a miniature Clark-type O electrode and autotrophic **bacteria**. To make the sensitive area less vulnerable to stress, to facilitate CO<sub>2</sub> diffusion through the sensitive area, and to make the application to biosensors easier, the sensor structure was simplified by immobilizing the **bacteria** in an O electrode cell along with a 0.1M KCl electrolyte solution. A novel process was developed that allows immobilization of **bacteria** in a small sensitive area, thereby improving the response time (1-3 min). A linear relation was obtained for NaHCO<sub>3</sub> concns. between 0.5 and 3.5 mM (at 32° and pH 5.5). The CO<sub>2</sub> sensor can be used ≤10 times before disposal.

L22 ANSWER 49 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1991:20595 HCAPLUS  
 DOCUMENT NUMBER: 114:20595  
 TITLE: Carbon dioxide diagnostic monitor and endotracheal or esophageal intubation system carbon dioxide monitor  
 INVENTOR(S): Lampotang, Samsun; Gravenstein, Dietrich; Gravenstein, Joachim S.; Gravenstein, Nikolaus; Banner, Michael J.  
 PATENT ASSIGNEE(S): University of Florida, USA  
 SOURCE: PCT Int. Appl., 41 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9003819	A1	19900419	WO 1989-US4296	19891005
W: JP, KR				
RW: AT, BE, CH, DE, FR, GB, IT, LU, NL, SE				
EP 455638	A1	19911113	EP 1989-911683	19891005
R: AT, BE, CH, DE, FR, GB, IT, LI, LU, NL, SE				
PRIORITY APPLN. INFO.:			US 1988-255400	19881011
			WO 1989-US4296	19891005

AB A monitor or system for detecting CO<sub>2</sub> content of a gas exiting a patient during endotracheal or esophageal intubation comprises a reservoir containing ≥1 composition having an initial pH .gtorsim. 3.8 and which substantially changes color in solution in response to exposure to CO<sub>2</sub>. The reservoir has an opening adapted for communication only with the gas exiting and entering the patient. A semipermeable membrane which is permeable to CO<sub>2</sub> covers the opening and separates the composition from the existing and entering gases. A monitor with a GE 1-mil DMS (di-Me silicone) membrane and various pH solns. of 0.1% bromothymol blue and 0.1%

phenolphthalein (pH 9.249, 9.772, 10.189, and 10.467) was tested. The color change with exposure to CO<sub>2</sub> was from ink-blue to bright yellow for the sensitive indicator (pH 9.249) and from royal blue to bright yellow for the 3 slower indicators (the latter pHs). No color change was obtained with volatile anesthetics. The monitor is attached to the tube after intubation. If the more sensitive indicator changes color within 4 breaths but the slower indicator does not change color within 9 breaths, then esophageal intubation with CO<sub>2</sub> in the stomach is a strong possibility. If all the indicators change colors within 9 breaths, endotracheal intubation is indicated. If during the procedure, the color of the less sensitive indicator reverts to its original color, the operator should check the tube for proper placement or delivery. Diagrammatic views of various embodiments of the monitor are shown as are graphical depictions of the influence of pH and membrane type on response time.

L22 ANSWER 50 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1991:20309 HCAPLUS

DOCUMENT NUMBER: 114:20309

TITLE: Preparation of the *Citrobacter freundii* bio-sensor for the determination of glucose and its applications

AUTHOR(S): Ihn, Gwon Shik; Hong, Young Seuk; Kim, Ui Rak; Jang, Seh Yong; Sohn, Moo Jeong

CORPORATE SOURCE: Coll. Nat. Sci., Keimyung Univ., Taegu, 704-200, Japan

SOURCE: Taehan Hwahakhoe Chi (1990), 34(5), 424-9

CODEN: DHWHAB; ISSN: 0418-2472

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A biosensor for the determination of glucose has been constructed by immobilizing

the *C. freundii* or its organelle on **carbon dioxide** gas-sensor. The **bacterial** sensor was better than the organelle in response, but the latter showed a shorter response time. The **bacterial** sensor gave linearity between  $7.0 + 10^{-4}$  and  $1.0 + 10^{-2}$  M glucose with a slope of 42.2 mV/decade in pH 7.0, 0.2M tris-HCl buffer at 30°. The selectivity of this sensor was very high for glucose. Employed for the determination of glucose in serum, the sensor

showed a good agreement with a routine analyzer.

L22 ANSWER 51 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 15

ACCESSION NUMBER: 1990:210264 HCAPLUS

DOCUMENT NUMBER: 112:210264

TITLE: Development of a disposable miniature L-lysine sensor

AUTHOR(S): Suzuki, Hiroaki; Tamiya, Eiichi; Karube, Isao

CORPORATE SOURCE: Fujitsu Lab., Ltd., Atsugi, 243-01, Japan

SOURCE: Analytica Chimica Acta (1990), 229(2), 197-203

CODEN: ACACAM; ISSN: 0003-2670

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A hybrid L-lysine sensor consisting of an immobilized L-lysine decarboxylase and a miniature **bacterial** CO<sub>2</sub> sensor was fabricated using semiconductor techniques. The **bacteria** were immobilized in a calcium alginate gel in a miniature oxygen electrode cell together with the electrolyte. The enzyme was immobilized in a bovine serum albumin matrix on a gas-permeable membrane. The cell was formed on a silicon substrate by anisotropic etching and had a two-gold-electrode configuration. The response time of the L-lysine sensor was 1-3 min. The optimum pH was 6.0 and the optimum temperature was 33°. The response to

L-lysine concentration was linear from 25 to 400  $\mu\text{M}$ . Reproducible responses were obtained by adding more than 1  $\mu\text{M}$  pyridoxal-5'-phosphate. The sensor had excellent selectivity for L-lysine and a stable response for more than 25 repetitive operations.

L22 ANSWER 52 OF 86 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN  
 ACCESSION NUMBER: 1990:283900 BIOSIS  
 DOCUMENT NUMBER: PREV199090014746; BA90:14746  
 TITLE: THE INFLUENCE OF MODIFIED ATMOSPHERE PACKAGING ON THE QUALITY OF SELECTED READY-TO-EAT FOODS.  
 AUTHOR(S): AHVENAINEN R [Reprint author]; SKYTТА E; KIVIKATAJA R-L  
 CORPORATE SOURCE: TECHNICAL RES CENT FINL, FOOD RES LAB, BIOLOGINKUJA 1, SF-02150 ESPOO, FINL  
 SOURCE: Lebensmittel-Wissenschaft and Technologie, (1990) Vol. 23, No. 2, pp. 139-148.  
 CODEN: LBWTAP. ISSN: 0023-6438.  
 DOCUMENT TYPE: Article  
 FILE SEGMENT: BA  
 LANGUAGE: ENGLISH  
 ENTRY DATE: Entered STN: 23 Jun 1990  
 Last Updated on STN: 24 Jun 1990

AB The **microbiological** and sensory shelf-life of miscellaneous ready-to-eat foods; ham pizza, mayonnaise-based potato salad and vegetable salad with herring, were studied in modified atmosphere packages and compared with those of air-packed products. The main benefit from the gas packaging of pizzas was retarding the growth of mould and the discoloration of pizzas. However, nitrogen alone could not prevent the development of mould; at least 20% (v/v) carbon dioxide was needed. To some extent, gas packaging also delayed the **microbiological** and sensory changes in vegetable salad with herring. From the **microbiological** point of view, the retarding of the growth of yeast was the most significant factor, particularly in an atmosphere containing CO<sub>2</sub>. With regard to sensory quality, modified atmosphere packaging improved the retention of taste, especially that of herring. However, modified atmosphere packaging increased the sensory shelf-life of salad by only a few days. The shelf-life of mayonnaise-based potato salad could not be improved by gas packaging. On the contrary, carbon dioxide in high concentration ( $\geq 20\%$ ) caused a strong, objectionable off-odour and off-taste in potato salad.

L22 ANSWER 53 OF 86 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN  
 ACCESSION NUMBER: 1990:457166 BIOSIS  
 DOCUMENT NUMBER: PREV199039092527; BR39:92527  
 TITLE: USING VAPOR-STERILIZED **CARBON DIOXIDE** AND OXYGEN **SENSORS** TO STUDY THE CULTIVATION OF STREPTOMYCES-GRISEUS STRAIN 420.  
 AUTHOR(S): LEBEDEV D P [Reprint author]; KHOZYAICHIKOV V N; SARAİKINA T A; AGAFONOV E L; BOYARKINA L A  
 CORPORATE SOURCE: ALL-UNION RES INST BIOL INSTRUM, MOSCOW 123371, USSR  
 SOURCE: Biotekhnologiya, (1990) No. 3, pp. 48-48.  
 CODEN: BTKNEZ. ISSN: 0234-2758.  
 DOCUMENT TYPE: Article  
 FILE SEGMENT: BR  
 LANGUAGE: RUSSIAN  
 ENTRY DATE: Entered STN: 13 Oct 1990  
 Last Updated on STN: 13 Oct 1990

L22 ANSWER 54 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 1990:171341 HCAPLUS

DOCUMENT NUMBER: 112:171341  
 TITLE: Electrochemical apparatus and method for detection of carbon dioxide  
 INVENTOR(S): Chandrasekhar, Prasanna; Venkatesetty, H. V.  
 PATENT ASSIGNEE(S): Honeywell Inc., USA  
 SOURCE: U.S., 8 pp.  
 CODEN: USXXAM  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4851088	A	19890725	US 1987-21956	19870305
PRIORITY APPLN. INFO.:			US 1987-21956	19870305

AB An electrochem. system, for the detection of CO<sub>2</sub>, includes a single-cell chamber exposed to the sample medium through a polymeric barrier membrane, as well as a single set of electrodes, and utilizes an aprotic nonaq. gelled solvent/electrolyte medium, which allows measurement of CO<sub>2</sub> in the presence of both O and H<sub>2</sub>O vapor.

L22 ANSWER 55 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 1990:194913 HCAPLUS  
 DOCUMENT NUMBER: 112:194913  
 TITLE: Apparatus for carbon dioxide detection and determination of pulmonary ventilation  
 INVENTOR(S): Ainsworth, Quentin Paul  
 PATENT ASSIGNEE(S): UK  
 SOURCE: Brit. UK Pat. Appl., 18 pp.  
 CODEN: BAXXDU  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
GB 2218515	A1	19891115	GB 1989-9532	19890426
PRIORITY APPLN. INFO.:			GB 1988-10072	19880426
			GB 1988-9828	19880426
			GB 1988-11780	19880518

AB The title apparatus comprises a means carrying a color change-type CO<sub>2</sub> indicator, the means being adapted for close association with a subject's pulmonary ventilation. A catalyst or enzyme, e.g. carbonic anhydrase, may be incorporated in the indicator. Thus, a moist, solid indicator comprised pH indicators (bromthymol blue and phenol red) in 1 mM Na carbonate solution with carbonic anhydrase, supported in a moist inert gas impermeable matrix and incorporated into the inner surface of a tubular device used to monitor correct placement of a tracheal tube.

L22 ANSWER 56 OF 86 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN  
 ACCESSION NUMBER: 1990:11958 BIOSIS  
 DOCUMENT NUMBER: PREV199038001258; BR38:1258  
 TITLE: DETERMINATION OF GASTRIC BICARBONATE SECRETION IN MAN WITHOUT ACID SUPPRESSION.  
 AUTHOR(S): VON KLEIST D [Reprint author]; FUCHS J; JANISCH H-D; HAMPEL K E  
 CORPORATE SOURCE: ABT GASTROENTEROL, UNIVERSITAETKLINIKUM RUDOLF VIRCHOW,

STANDORT CHARLOTTENBURG, SPANDAUER DAMM 130, D-1000 BERLIN  
19  
SOURCE: Zeitschrift fuer Gastroenterologie, (1989) Vol. 27, No. 8,  
pp. 412-417.  
CODEN: ZGASAX. ISSN: 0044-2771.  
DOCUMENT TYPE: Article  
FILE SEGMENT: BR  
LANGUAGE: GERMAN  
ENTRY DATE: Entered STN: 12 Dec 1989  
Last Updated on STN: 13 Dec 1989

L22 ANSWER 57 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 16

ACCESSION NUMBER: 1990:90555 HCAPLUS  
DOCUMENT NUMBER: 112:90555  
TITLE: Fabrication of a **microbial carbon dioxide sensor** using semiconductor  
fabrication techniques

AUTHOR(S): Suzuki, Hiroaki; Kojima, Naomi; Sugama, Akio; Takei,  
Fumio; Ikegami, Kasumi; Tamiya, Eiichi; Karube, Isao  
CORPORATE SOURCE: Fujitsu Lab., Ltd., Atsugi, 243-01, Japan  
SOURCE: Electroanalysis (1989), 1(4), 305-9  
CODEN: ELANEU; ISSN: 1040-0397

DOCUMENT TYPE: Journal  
LANGUAGE: English

AB A disposable **bacterial** CO2 sensor has been fabricated using  
semiconductor techniques by immobilizing autotrophic **bacteria** on  
the sensitive area of a miniature Clark-type O electrode and covering them  
with another gas-permeable membrane consisting of a neg. photoresist  
formed directly on the gel. The response time of the CO2 sensor was 2 to  
3 min. A linear relationship for the NaHCO3 concentration was obtained between  
0.5 and 3.5 mM at 30° and pH 5.5. The CO2 sensor can be used up to  
10 times.

L22 ANSWER 58 OF 86 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN

ACCESSION NUMBER: 89:423828 SCISEARCH  
THE GENUINE ARTICLE: AH818  
TITLE: FABRICATION OF A **MICROBIAL CARBON-DIOXIDE SENSOR** USING SEMICONDUCTOR  
FABRICATION TECHNIQUES

AUTHOR: SUZUKI H (Reprint); KOJIMA N; SUGAMA A; TAKEI F; IKEGAMI  
K; TAMIYA E; KARUBE I  
CORPORATE SOURCE: FUJITSU LABS LTD, 10-1 MORINOSATA WAKAMIYA, ATSUGI 24301,  
JAPAN (Reprint); UNIV TOKYO, ADV SCI & TECHNOL RES CTR,  
TOKYO 153, JAPAN  
COUNTRY OF AUTHOR: JAPAN  
SOURCE: ELECTROANALYSIS, (1989) Vol. 1, No. 4, pp. 305-309.  
DOCUMENT TYPE: Article; Journal  
FILE SEGMENT: PHYS  
LANGUAGE: ENGLISH  
REFERENCE COUNT: 12

L22 ANSWER 59 OF 86 AGRICOLA Compiled and distributed by the National  
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(2004) on STN

ACCESSION NUMBER: 89:81715 AGRICOLA  
DOCUMENT NUMBER: IND89043381  
TITLE: Effect of gas atmosphere, storage temperature and  
storage time on the shelflife and sensory attributes

AUTHOR(S): of vacuum packaged ground beef patties.  
Bently, D.S.; Reagan, J.O.; Miller, M.F.  
CORPORATE SOURCE: Univ. of Georgia, Athens, GA  
AVAILABILITY: DNAL (389.8 F7322)  
SOURCE: Journal of food science : an official publication of  
the Institute of Food Technologists, Mar/Apr 1989.  
Vol. 54, No. 2. p. 284-286  
Publisher: Chicago, Ill. : The Institute.  
CODEN: JFDAZ6; ISSN: 0022-1147  
NOTE: Includes references.  
DOCUMENT TYPE: Article  
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension  
LANGUAGE: English

AB The effects of modified atmosphere packaging systems on the shelflife and palatability attributes of ground beef patties were determined. Packaging systems evaluated were 100% nitrogen backflush, 100% carbon dioxide backflush and no gas backflush (no oxygen). Vacuum-packaged samples were stored at 0, 4, and 8 degrees for 7, 14, and 21 days. Percent purge increased as storage temperature increased and as time in storage increased (up to 14 days of storage). Nitrogen backflush produced the lowest purge values; vacuum packaged controls had the highest levels. Kramer shear values and **microbial** counts increased with time in storage. **Sensory** traits indicated that the **carbon dioxide** treatment yielded higher taste panel scores. Sensory panel scores. Sensory panel values decreased with time in storage.

L22 ANSWER 60 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 17

ACCESSION NUMBER: 1989:50448 HCAPLUS  
DOCUMENT NUMBER: 110:50448  
TITLE: Microelectrodes coated with ionically conducting  
polymer **membranes** for voltammetric  
**detection** in flowing supercritical  
**carbon dioxide**

AUTHOR(S): Michael, Adrian C.; Wightman, R. Mark  
CORPORATE SOURCE: Dep. Chem., Indiana Univ., Bloomington, IN, 47405, USA  
SOURCE: Analytical Chemistry (1989), 61(3), 270-2  
CODEN: ANCHAM; ISSN: 0003-2700

DOCUMENT TYPE: Journal  
LANGUAGE: English

AB It has previously been shown that the resistance of supercrit. CO2 is too high for voltammetry, even with microelectrodes, unless electrolytes and/or polar modifiers are present in the fluid. In supercrit. fluid flow systems, such as supercrit. fluid chromatog. (SFC), the use of an added electrolyte is not desirable. As an alternative, an ionically conductive polymer membrane placed in contact with a platinum disk microelectrode and a platinum quasireference electrode has been used. Undistorted voltammograms of ferrocene dissolved in supercrit. CO2 in the presence of small quantities of H2O have been obtained without the use of addnl. supporting electrolyte. Expts. performed in a supercrit. CO2 flow stream demonstrate the potential utility of the membrane coated microelectrode as an SFC detector.

L22 ANSWER 61 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1989:624251 HCAPLUS  
DOCUMENT NUMBER: 111:224251  
TITLE: Fiber-optic sensor for carbon dioxide with a pH  
indicator dispersed in a poly(ethylene glycol)  
membrane

AUTHOR(S): Kawabata, Yuji; Kamichika, Toshito; Imasaka, Totaro;



CORPORATE SOURCE: Ishibashi, Nobuhiko  
SOURCE: Fac. Eng., Kyushu Univ., Fukuoka, 812, Japan  
Analytica Chimica Acta (1989), 219(2), 223-9  
CODEN: ACACAM; ISSN: 0003-2670

DOCUMENT TYPE: Journal  
LANGUAGE: English

AB A fiber-optic sensor for carbon dioxide gas was constructed, without an inner buffer solution, by using a dispersion of fluorescein in poly(ethylene glycol) deposited on the distal end of an optical fiber. Evaporation of the solvent is thus negligible. The response range is 0-28% (by volume) for carbon dioxide, with a detection limit of 0.1%. The response time achieved is 10 s. The membrane (.apprx.10  $\mu$ m thick) is composed of poly(ethylene glycol) with mol. wts. of 200 and 1540 dalton in a 20:80% (by weight) ratio. The best concentration of fluorescein is 5 + 10<sup>-7</sup> mol g<sup>-1</sup> of poly(ethylene glycol). The response mechanism of the sensor is discussed.

L22 ANSWER 62 OF 86 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN  
ACCESSION NUMBER: 1989:222989 BIOSIS  
DOCUMENT NUMBER: PREV198987114606; BA87:114606  
TITLE: THE EFFECT OF SLAUGHTER METHOD ON THE QUALITY OF RAINBOW  
TROUT SALMO-GAIRDNERI DURING STORAGE ON ICE.  
AUTHOR(S): AZAM K [Reprint author]; MACKIE I M; SMITH J  
CORPORATE SOURCE: MINISTRY AGRIC, FISHERIES AND FOOD, TORRY RES STATION, 135  
ABBEY ROAD, ABERDEEN AB9 8DG, SCOTLAND, UK  
SOURCE: International Journal of Food Science and Technology,  
(1989) Vol. 24, No. 1, pp. 69-80.  
CODEN: IJFTEZ. ISSN: 0950-5423.  
DOCUMENT TYPE: Article  
FILE SEGMENT: BA  
LANGUAGE: ENGLISH  
ENTRY DATE: Entered STN: 7 May 1989  
Last Updated on STN: 7 May 1989

AB Rainbow trout (*Salmo gairdneri*) were stunned by electrocution, exposure to elevated concentrations of carbon dioxide and by a blow to the head, and subsequently bled. The fish were stored ungutted in ice for up to 15 days, and the changes in the textural properties of the flesh of the fish were measured by a sensory panel and with a texturometer. Parallel changes in the concentrations of spoilage-related biochemical constituents, in water-holding capacity and in **bacterial** counts were also determined. Slaughter by electrocution and by carbon dioxide narcotization led to a greater initial production of lactic acid and a slightly reduced pH, compared with slaughter by a blow to the head. No significant differences were found in the values of the other indices of quality, either immediately after death or during post-mortem storage.

L22 ANSWER 63 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 18  
ACCESSION NUMBER: 1989:188615 HCAPLUS  
DOCUMENT NUMBER: 110:188615  
TITLE: A hybrid L-tyrosine sensor using an enzyme and a  
**bacterial carbon dioxide  
sensor**  
AUTHOR(S): Suzuki, Hiroaki; Tamiya, Eiichi; Karube, Isao  
CORPORATE SOURCE: Fujitsu Lab., Atsugi, 243-01, Japan  
SOURCE: Analytical Letters (1989), 22(1), 15-24  
CODEN: ANALBP; ISSN: 0003-2719  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB An L-tyrosine sensor consisting of immobilized L-tyrosine decarboxylase

and an amperometric **bacterial** CO<sub>2</sub> sensor was developed and evaluated. The optimum pH was 5.5 and the optimum temperature was 32-34°. A linear calibration curve was obtained for L-tyrosine concns. of 10-50 µM.

L22 ANSWER 64 OF 86 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN  
 ACCESSION NUMBER: 1989:220055 BIOSIS  
 DOCUMENT NUMBER: PREV198987111672; BA87:111672  
 TITLE: PREPARATION OF THE PROTEUS-MIRABILIS **BACTERIAL**  
 ELECTRODE FOR THE DETERMINATION OF UREA AND ITS CLINICAL  
 APPLICATIONS.  
 AUTHOR(S): IHN G S [Reprint author]; WOO S T; SOHN M J; BUCK R P  
 CORPORATE SOURCE: DEP CHEM, COLL NATURAL SCI, KEIMYUNG UNIV, DAEGU 704-200,  
 KOREA  
 SOURCE: Analytical Letters, (1989) Vol. 22, No. 1, pp. 1-14.  
 CODEN: ANALBP. ISSN: 0003-2719.  
 DOCUMENT TYPE: Article  
 FILE SEGMENT: BA  
 LANGUAGE: ENGLISH  
 ENTRY DATE: Entered STN: 7 May 1989  
 Last Updated on STN: 7 May 1989

AB A **bacterial** electrode for the determination of urea has been constructed by immobilizing the Proteus mirabilis on a **carbon dioxide gas-sensor**. The electrode gave a Nernstian behaviour between  $7.0 \times 10^{-4}$  and  $3.0 \times 10^{-2}$  M urea with a slope of 46 mV/decade in pH 6.80, 0.1 M phosphate buffer at 30° C. The important interferences were L-asparagine, cytosine, inositol and phenol, and most inorganic salts reacted as the inhibitor. This electrode showed little change in the response and linear range for 7 days, and could also be used in the linear range because the electrode had good reproducibility even after this. This device could be used as easily and exactly as a spectrophotometric method in clinical applications.

L22 ANSWER 65 OF 86 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN  
 ACCESSION NUMBER: 1990:353565 BIOSIS  
 DOCUMENT NUMBER: PREV199090050144; BA90:50144  
 TITLE: GAS PACKAGING OF CHILLED MEAT PRODUCTS AND READY-TO-EAT  
 FOODS.  
 AUTHOR(S): AHVENAINEN R [Reprint author]  
 CORPORATE SOURCE: FOOD RESEARCH LAB BIOLOGINKUJA 1, SF-02150 ESPOO, FINL  
 SOURCE: Technical Research Centre of Finland Publications, (1989)  
 No. 58, pp. 1-68.  
 CODEN: PTRFDT. ISSN: 0358-5069.  
 DOCUMENT TYPE: Article  
 FILE SEGMENT: BA  
 LANGUAGE: ENGLISH  
 ENTRY DATE: Entered STN: 7 Aug 1990  
 Last Updated on STN: 7 Aug 1990

AB Interest in the use of gases in the packaging of cooked food products has increased considerably in recent years. Therefore the quality as well as the **microbiological** and sensory shelf-life of selected chilled cooked meat products and ready-to-eat foods packed using nitrogen and carbon dioxide (gas packaging) were studied and compared with those of regularly packed products (air or a vacuum). In addition, to obtain full benefit from gas packaging, the effects of some basic factors, such as the optimal gas compositions, gas permeability of packaging materials, head-space volume and initial **microbiological** quality, were studied. Furthermore, the quality of gas-packed ready-to-eat foods stored in both opened and leaking packages was investigated. Gas packaging

improved the sensory quality and shelf-life of several meat and ready-to-eat products. The best gas composition for cooked meat products was a mixture of 20% CO<sub>2</sub> + 80% N<sub>2</sub>, whereas for ready-to-eat products the optimal gas composition was very dependent on the product. However, gas packaging did not improve the shelf-life of mayonnaise-based potato salad. Gas also had an obvious residual inhibitory effect on the quality deterioration of minced meat steaks, but it lasted only some days. On the other hand, the quality retention of minced meat steaks was even poorer in leaking gas packages than in sealed air packages. Among the factors studied, the length of the delay in packaging had the most significant effect on the quality and shelf-life of gas-packed products. So-called high barrier materials, e.g. materials including EVAL or PVDC layers, did not lengthen the shelf-life of gas-packed products. Instead, high barrier materials essentially improved the shelf-life of vacuum-packed products. A gas volume in which a product was not yet compressed was sufficient. This study also showed very clearly that in shelf-life studies involving new preservation techniques applied to food products attention should be paid to the retention of sensory quality in conjunction with **microbiological** parameters. Furthermore, the appearance of unopened packages is important.

L22 ANSWER 66 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 19

ACCESSION NUMBER: 1989:4177 HCAPLUS  
DOCUMENT NUMBER: 110:4177  
TITLE: Autotrophic **bacteria** immobilized on

**carbon dioxide sensor**  
INVENTOR(S): Karube, Masao; Suzuki, Hiroaki  
PATENT ASSIGNEE(S): Fujitsu Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.  
CODEN: JKXXAF

DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 63065358	A2	19880323	JP 1986-210293	19860905
PRIORITY APPLN. INFO.:			JP 1986-210293	19860905

AB In the title CO<sub>2</sub> sensor, an O electrode is composed of part of an electrolyte container (immersing an anode and a cathode) made of a 1st gas-permeable film. Autotrophic **bacteria** are placed near the 1st gas-permeable film and coated with a dialysis film. An O- and buffer-supplying cell is contacted with the dialysis film on one side, and the other side of the cell is coated with a 2nd gas-permeable film. A sample-supplying cell is contacted with the 2nd gas-permeable film. A thermophilic autotroph, TIT/FJ-0002, was deposited on a nitrocellulose membrane filter and immobilized for a CO<sub>2</sub> sensor. Since enough nutrition (e.g., O) was supplied to the sensor, the autotrophic **bacteria** lived longer, so that the sensor's durability was improved.

L22 ANSWER 67 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1989:224622 HCAPLUS  
DOCUMENT NUMBER: 110:224622  
TITLE: Electrodes of **carbon dioxide**

**sensor**  
INVENTOR(S): Suzuki, Hiroaki  
PATENT ASSIGNEE(S): Fujitsu Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.

DOCUMENT TYPE: CODEN: JKXXAF  
 LANGUAGE: Patent  
 FAMILY ACC. NUM. COUNT: 1 Japanese  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 63279157	A2	19881116	JP 1987-113927	19870511
PRIORITY APPLN. INFO.:			JP 1987-113927	19870511

AB The title electrodes comprise a substrate having a concave region, 2 mutually insulated electrodes in the concave region, aerobic autotrophic **bacteria** fixed in the concave region, and a gas-permeable film covering the **bacteria**. These electrodes are useful in fermentation processes.

L22 ANSWER 68 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1989:4178 HCAPLUS  
 DOCUMENT NUMBER: 110:4178  
 TITLE: **Carbon dioxide sensor**  
 with immobilized autotrophic **bacteria**  
 INVENTOR(S): Karube, Masao; Suzuki, Hiroaki  
 PATENT ASSIGNEE(S): Fujitsu Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 63065357	A2	19880323	JP 1986-210292	19860905
PRIORITY APPLN. INFO.:			JP 1986-210292	19860905

AB In the title CO2 sensor, an O electrode comprises part of an electrolyte container (immersing an anode and a cathode) made of a 1st gas-permeable film. Autotrophic **bacteria** are placed near the 1st gas-permeable film and coated with a dialysis film. The dialysis film is put on a buffer-supplying cell, which supplies O. The buffer-supplying cell has a sample-supplying surface as a 2nd gas-permeable film. A thermophilic autotroph, TIT/FJ-0002, was deposited on a nitrocellulose membrane filter and immobilized for a CO2 sensor. Since enough nutrition (e.g., O) was supplied to the sensor, the autotrophic **bacteria** lived longer, so that the sensor's durability was improved.

L22 ANSWER 69 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 20

ACCESSION NUMBER: 1988:607648 HCAPLUS  
 DOCUMENT NUMBER: 109:207648  
 TITLE: **Carbon dioxide sensor**  
 using thermophilic **bacteria**  
 AUTHOR(S): Suzuki, Hiroaki; Tamiya, Eiichi; Karube, Isao; Oshima, Tairo  
 CORPORATE SOURCE: Fujitsu Lab., Ltd., Atsugi, 243-01, Japan  
 SOURCE: Analytical Letters (1988), 21(8), 1323-36  
 CODEN: ANALBP; ISSN: 0003-2719  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB The amperometric CO2 sensor developed uses chemoautotrophic thermophilic **bacteria** and an O-sensing electrode. The sensor was fabricated by

packing the sensitive area of the bicarbonate sensor in a cell with a gas-permeable membrane on 1 side. The membrane was constantly supplied with an O-saturated buffer solution. The sensor's operating range was 34-58°. A linear relation was obtained for a 1-8-mM NaHCO<sub>3</sub> concentration in a buffer solution (pH 5.5) and a 3-12% CO<sub>2</sub> concentration in air. The effect of the sensor's low sensitivity to NaOAc and EtOH was greatly improved by supplying fresh, -saturated buffer solution. The sensor had a life of >1 mo.

L22 ANSWER 70 OF 86 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN  
 ACCESSION NUMBER: 88:456494 SCISEARCH  
 THE GENUINE ARTICLE: P6227  
 TITLE: **CARBON-DIOXIDE SENSOR USING THERMOPHILIC BACTERIA**  
 AUTHOR: SUZUKI H (Reprint); TAMIYA E; KARUBE I; OSHIMA T  
 CORPORATE SOURCE: FUJITSU LABS LTD, 10-1 MORINOSATO WAKAMIYA, ATSUGI 24301, JAPAN (Reprint); TOKYO INST TECHNOL, RESOURCES UTILIZAT RES LAB, MIDORI KU, YOKOHAMA, KANAGAWA 227, JAPAN; TOKYO INST TECHNOL, FAC SCI, MIDORI KU, YOKOHAMA, KANAGAWA 227, JAPAN  
 COUNTRY OF AUTHOR: JAPAN  
 SOURCE: ANALYTICAL LETTERS, (1988) Vol. 21, No. 8, pp. 1323-1336.  
 DOCUMENT TYPE: Article; Journal  
 FILE SEGMENT: PHYS; LIFE  
 LANGUAGE: ENGLISH  
 REFERENCE COUNT: 9

L22 ANSWER 71 OF 86 WPIDS COPYRIGHT 2004 THOMSON DERWENT on STN  
 ACCESSION NUMBER: 1987-303790 [43] WPIDS  
 DOC. NO. NON-CPI: N1987-226906  
 DOC. NO. CPI: C1987-129426  
 TITLE: Sensor for carbon di oxide - has thermophilic in dependent nutritive **bacterium** near gas permeable film of fluoro-polymer of oxygen electrode.  
 DERWENT CLASS: D16 E36 J04 S03  
 PATENT ASSIGNEE(S): (FUIT) FUJITSU LTD  
 COUNTRY COUNT: 1  
 PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
JP 62214345	A	19870921	(198743)*		

## APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
JP 62214345	A	JP 1986-58704	19860317

PRIORITY APPLN. INFO: JP 1986-58704 19860317

AN 1987-303790 [43] WPIDS

AB JP 62214345 A UPAB: 19930922

In a **sensor** for **carbon dioxide**, a thermophilic independent nutritive **bacterium**, e.g., *Sufolobus acidocaldarius*, etc., which consumes CO<sub>2</sub> is set near the first gas permeable film of a fluoro polymer of an oxygen electrode. The electrodes consists of a first gas permeable film in a part of a container housing an electrolyte into which an anode and a cathode immersed. The thermophilic

independent nutritive **bacterium** set near the first gas permeable film is covered with the second gas permeable film of a fluoro polymer or silicon rubber. In this case, the oxygen electrode is a galvanic or polar type, and the nutritive **bacterium** is cultivated at 3- - 75 deg. C at pH 6.5 and has a length of 2 - 3 micron. USE/ADVANTAGE - The sensor, featuring using a combination of a thermophilic independent nutritive **bacterium** and oxygen sensor, can effectively detect CO2 gas even at temperature above 50 deg.C.  
0/0

L22 ANSWER 72 OF 86 EMBASE COPYRIGHT 2004 ELSEVIER INC. ALL RIGHTS RESERVED.  
on STN

ACCESSION NUMBER: 87169861 EMBASE  
DOCUMENT NUMBER: 1987169861  
TITLE: Bicarbonate and ammonia changes in brain during spreading depression.  
AUTHOR: Kraig R.P.; Cooper A.J.L.  
CORPORATE SOURCE: Department of Neurology, Cornell University Medical College, New York, NY 10021, United States  
SOURCE: Canadian Journal of Physiology and Pharmacology, (1987) 65/5 (1099-1104).  
CODEN: CJPPA3  
COUNTRY: Canada  
DOCUMENT TYPE: Journal  
FILE SEGMENT: 008 Neurology and Neurosurgery  
002 Physiology  
LANGUAGE: English  
SUMMARY LANGUAGE: French

AB An alkaline, followed by an acid-going transient, characterizes acid-base changes in the interstitial space during spreading depression in a variety of brain structures. In rat, such changes are associated with a significant rise in brain lactate content. How brain proton buffers behave during spreading depression is unknown. Techniques to significantly improve the response time of gas permeable **membrane** semimicroelectrodes for **carbon dioxide** and ammonia are reported. **Measurements** with such electrodes, when coupled to measurements of hydrogen ion concentration (from microelectrodes), permit rapid changes to be determined in bicarbonate concentration or ammonia and ammonium ion concentration, respectively. Bicarbonate concentration fell from  $30 \pm 1$  (n = 16) to  $14 \pm 1$  mM (n = 16) during spreading depression. On the other hand, ammonia concentration rose from  $2.3 \pm 0.1$  to  $4.4 \pm 0.3$   $\mu$ M (n = 17) while ammonium ion concentration rose from  $116 \pm 11$  (n = 17) to  $382 \pm 30$   $\mu$ M (n = 17) during spreading depression. Bicarbonate changes probably reflect titration of brain bicarbonate stores by accumulated lactic acid. Similar physicochemical changes do not explain the rise in ammonia and ammonium ion concentrations. Instead, elevation of the latter can only result from an increase in ammonia content of the interstitial space.

L22 ANSWER 73 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1989:449489 HCAPLUS  
DOCUMENT NUMBER: 111:49489  
TITLE: Recent advances in the design of anion and gas selective potentiometric membrane electrodes  
AUTHOR(S): Meyerhoff, M. E.; Pranitis, David M.; Chaniotakis, Nikolas A.  
CORPORATE SOURCE: Dep. Chem., Univ. Michigan, Ann Arbor, MI, 48109, USA  
SOURCE: Advances in Instrumentation (1987), 42(1), 469-78  
CODEN: AVINBP; ISSN: 0065-2814

DOCUMENT TYPE: Journal  
LANGUAGE: English

AB New approaches to the design of anion and gas selective potentiometric sensors are described. In each case, polymeric membranes doped with ion-exchangers or neutral carriers serve as the transducers. For anion sensing, significant deviations from the classical Hofmeister selectivity pattern can be realized when Mn(III) metalloporphyrins are used as active membrane components. Absolute selectivity sequences can be altered by varying the chemical structure of the porphyrin. For gas sensing (e.g., CO<sub>2</sub>, NH<sub>3</sub> and NO<sub>x</sub>), appropriate anion- or cation-selective polymer membrane electrodes may be used in various configurations as internal detectors behind outer gas-permeable membranes. As an example, a highly selective system for continuous monitoring of atmospheric levels of ammonia in the 0.5-2.0 ppb range is detailed.

L22 ANSWER 74 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1988:91130 HCAPLUS

DOCUMENT NUMBER: 108:91130

TITLE: An amperometric **sensor for carbon dioxide** based on immobilized **bacteria** utilizing carbon dioxide

AUTHOR(S): Suzuki, Hiroaki; Tamiya, Eiichi; Karube, Isao

CORPORATE SOURCE: Fujitsu Lab. Ltd., Atsugi, 243-01, Japan

SOURCE: Analytica Chimica Acta (1987), 199, 85-91

CODEN: ACACAM; ISSN: 0003-2670

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A biosensor consisting of a CO<sub>2</sub>-utilizing autotrophic **bacterium** (strain S-17, Pseudomonas type) and an O-sensing electrode was constructed for the amperometric determination of CO<sub>2</sub>. The correlation between current decrease and CO<sub>2</sub> concentration was linear in the range 5-200 mg/L CO<sub>2</sub>. The optimum temperature and pH for operation of the biosensor were 30° and 5.5, resp. The sensor did not respond to other volatile compds. except for HOAc. The sensor could be operated continuously for .apprx.1 mo.

L22 ANSWER 75 OF 86 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN

ACCESSION NUMBER: 88:33995 SCISEARCH

THE GENUINE ARTICLE: L5913

TITLE: AN AMPEROMETRIC **SENSOR FOR CARBON-DIOXIDE** BASED ON IMMOBILIZED **BACTERIA** UTILIZING CARBON-DIOXIDE

AUTHOR: SUZUKI H; TAMIYA E; KARUBE I (Reprint)

CORPORATE SOURCE: TOKYO INST TECHNOL, RESOURCES UTILIZAT RES LAB, 4259 NAGATSUTA CHO, MIDORI KU, YOKOHAMA, KANAGAWA 227, JAPAN; FUJITSU LABS LTD, ATSUGI 24301, JAPAN

COUNTRY OF AUTHOR: JAPAN

SOURCE: ANALYTICA CHIMICA ACTA, (1987) Vol. 199, No. AUG, pp. 85-91.

DOCUMENT TYPE: Article; Journal

FILE SEGMENT: PHYS

LANGUAGE: ENGLISH

REFERENCE COUNT: 9

L22 ANSWER 76 OF 86 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN

ACCESSION NUMBER: 1986:219655 BIOSIS

DOCUMENT NUMBER: PREV198681110955; BA81:110955

TITLE: BULK STORAGE OF COD FILLETS AND GUTTED COD GADUS-MORHUA UNDER CARBON DIOXIDE ATMOSPHERE.

AUTHOR(S): VILLEMURE G [Reprint author]; SIMARD R E; PICARD G

CORPORATE SOURCE: DEP SCI ET TECHNOLOGIE DES ALIMENTS, CENTRE DE RECHERCHE EN  
NUTRITION, UNIV LAVAL, STE-FOY, QUEBEC, CANADA G1K 7P4  
SOURCE: Journal of Food Science, (1986) Vol. 51, No. 2, pp.  
317-320.  
CODEN: JFDSA. ISSN: 0022-1147.  
DOCUMENT TYPE: Article  
FILE SEGMENT: BA  
LANGUAGE: ENGLISH  
ENTRY DATE: Entered STN: 28 May 1986  
Last Updated on STN: 28 May 1986

AB The storage-life of bulk-stored cod under CO<sub>2</sub> atmosphere and air were compared. Gutted fish or fillets were distributed in bulk, among coolers containing 100% air or 25% CO<sub>2</sub>-75% N<sub>2</sub>, which were then stored at 0 ± 1° C for 20 days. Sensory assessments and chemical tests (pH, total volatile nitrogen) were carried out to estimate the raw-state quality and the **bacterial** spoilage. An important difference was observed between the storage life of cod under **carbon dioxide** atmosphere and air; **microbiological** and **sensory** assessments suggested a storage life exceeding 20 days and total volatile nitrogen results about 6-7 days under gas atmosphere, which was nearly twice as long as in air. Storage in CO<sub>2</sub> atmosphere was effective in inhibiting the growth of some **bacteria** on the fish, thereby contributing to the significant extension of the shelf life of the product.

L22 ANSWER 77 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1986:507655 HCAPLUS  
DOCUMENT NUMBER: 105:107655  
TITLE: Comparison of **microbial** sensors based on  
amperometric and potentiometric electrodes  
AUTHOR(S): Mascini, Marco; Memoli, Adriana  
CORPORATE SOURCE: Dip. Sci. Tecnol. Chim., Univ. Roma, Rome, 00173,  
Italy  
SOURCE: Analytica Chimica Acta (1986), 182, 113-22  
CODEN: ACACAM; ISSN: 0003-2670  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB **Microbial** sensors based on O and CO<sub>2</sub> electrodes coupled with immobilized Saccharomyces are compared for measurements of glucose and other carbohydrates. With the O sensor, the yeast works under aerobic conditions but anaerobically with the CO<sub>2</sub> sensor. The two metab. of the same strain make little difference to the lifetimes (>15 days), selectivities, and response rates (5-10 min) of the sensors. The effects of pH are very different owing to the pH sensitivity of the CO<sub>2</sub> sensor. The viable concentration ranges overlap; the O-based sensor is more useful for low concns. of glucose (0.01-1 mmol L<sup>-1</sup>) while the CO<sub>2</sub>-based sensor is better suited for 1-10 mmol L<sup>-1</sup>. With the O-based sensor, the response time is governed by the rate of metabolism; with the CO<sub>2</sub>-based sensor, the response time of the potentiometric CO<sub>2</sub> electrode is the rate determining step.

L22 ANSWER 78 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1987:134478 HCAPLUS  
DOCUMENT NUMBER: 106:134478  
TITLE: Amperometric **microbiosensors** and  
**carbon dioxide sensor**  
AUTHOR(S): Karube, Isao  
CORPORATE SOURCE: Res. Lab. Resour. Util., Tokyo Inst. Technol.,  
Yokohama, 227, Japan  
SOURCE: Proceedings - Electrochemical Society (1986),



86-14 (Electrochem. Sens. Biomed. Appl.), 55-65  
CODEN: PESODO; ISSN: 0161-6374

DOCUMENT TYPE: Journal  
LANGUAGE: English

AB Micro-Au electrodes for H<sub>2</sub>O<sub>2</sub> or O determination were prepared by using silicon fabrication technol. A micro-glucose sensor consisted of a micro-H<sub>2</sub>O<sub>2</sub> sensor and in immobilized glucose oxidase membranes. A linear relationship was observed between the current increase and the concentration of glucose (0.1-10 mg/dL). A micro-O sensor was prepared with a micro-Au electrode, alkaline electrolyte, and a Teflon membrane. A micro-glutamate sensor was consisted of micro-O sensor and an immobilized glutamate oxidase membrane. A linear relationship was obtained between glutamate concns. ranging 5-50 mM and the current decrease. An amperometric CO<sub>2</sub> sensor was developed incorporating CO<sub>2</sub>-utilizing **bacteria** and an oxygen sensor. The response time of the sensor was .apprx.3 min and a linear correlation between the current decrease and CO<sub>2</sub> concentration was obtained with 5-200 ppm CO<sub>2</sub>.

L22 ANSWER 79 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 1985:127101 HCAPLUS  
DOCUMENT NUMBER: 102:127101  
TITLE: Biological sensor for detecting toxicants  
INVENTOR(S): Stiffey, Arthur V.; Jarvis, Lynn N.; Wohltjen, Henry  
PATENT ASSIGNEE(S): United States Dept. of the Navy, USA  
SOURCE: U. S. Pat. Appl., 21 pp. Avail. NTIS Order No.  
PAT-APPL-6-656 208.  
CODEN: XAXXAV  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

06/ PATENT NO. KIND DATE APPLICATION NO. DATE  
-----  
US 656208 A0 19850118 US 1984-656208 19841001 4,513,280  
PRIORITY APPLN. INFO.: US 1984-656208 19841001  
AB A biol. sensor is described for detecting toxicants, based on  
**microbial** (e.g., *Saccharomyces cerevisiae*) growth, CO<sub>2</sub> generation,  
transfer through a permeable membrane, a pH decrease due to CO<sub>2</sub>, a pH  
meter, and an alarm to indicate a change in pH in comparison with the  
production of CO<sub>2</sub> by control microorganisms not exposed to toxicant;  
appropriate nutrient media, recommended voltage differences for triggering  
the alarm, flushing mechanisms, and apparatus design were also described.

L22 ANSWER 80 OF 86 WPIDS COPYRIGHT 2004 THOMSON DERWENT on STN  
ACCESSION NUMBER: 1985-120847 [20] WPIDS  
DOC. NO. NON-CPI: N1985-090728  
DOC. NO. CPI: C1985-052719  
TITLE: Biological medium carbon di oxide partial pressure  
measurer - has electrode system formed by two  
four-electrode cells located in outlet and inlet channels  
of conductance sensor.  
DERWENT CLASS: D16 J04 S03  
INVENTOR(S): ANDREEV, S N  
PATENT ASSIGNEE(S): (APPL-R) APPLIED MICROBIOLOG  
COUNTRY COUNT: 1  
PATENT INFORMATION:

PATENT NO KIND DATE WEEK LA PG

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 SU 1117519      A    19841007 (198520)\*      4

## APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
SU 1117519	A	SU 1983-3554131	19830210

PRIORITY APPLN. INFO: SU 1983-3554131      19830210

AN 1985-120847 [20]    WPIDS

AB SU 1117519 A UPAB: 19930925

The unit contains a sensor (1) with inlet (2) and outlet (3) channels communicating by a membrane-covered (6) groove (5), solution flow rate regulator (7) for the tank (8), current generator (18), measuring converter (19) and recorder (20). It also includes another sensor channel (4). The tank communicates with the outlet channel through the valve (11). The sensor has an electrode system with comparison (14) and active (15) cells and current (16) and potential (17) electrodes.

A definite quantity of alkaline solution flows at a definite speed through the **sensor**. If **carbon dioxide** molecules appear in the medium, under the influence of the partial pressure they pass through the membrane and interact with the solution, so changing the conductance of the solution entering the active cell from the groove. The conductance change is converted for recording.

USE/ADVANTAGE - In materials investigation and analysis by measurement of gas pressure, e.g. in **microbiological** research, accuracy is increased and results are more certain by monitoring the measuring process during long experiments. The calibration curve is linear and direct and reverse dynamic characteristics are the same.

Bul.37/7.10.84

1/1

L22 ANSWER 81 OF 86    WPIDS    COPYRIGHT 2004 THOMSON DERWENT on STN

ACCESSION NUMBER:    1984-317133 [51]    WPIDS

DOC. NO. NON-CPI:    N1984-236464

DOC. NO. CPI:    C1984-135498

TITLE:    Yeast microorganisms cultivation control system - has computing unit operating valve to displace culture solution from comparison chamber into fermenter when solns. differ cyclically.

DERWENT CLASS:    D16 T06 X25

INVENTOR(S):    LADANYUK, A P; NIKOLAENKO, V F; SOKOLENKO, A I

PATENT ASSIGNEE(S):    (KIFO) KIEV FOOD IND TECHN INST

COUNTRY COUNT:    1

PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
SU 1089114	A	19840430	(198451)*		4

## APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
SU 1089114	A	SU 1979-2760130	19790423

PRIORITY APPLN. INFO: SU 1979-2760130 19790423

AN 1984-317133 [51] WPIDS

AB SU 1089114 A UPAB: 19930925

Microorganisms cultivation control system containing a fermenter (1), temperature sensor (2) in a temperature stabilisation circuit, pH-sensor (6), ammonia water (8), sulphuric acid (9) and oleic acid (12) feed units, programmed (14) dosators (13) for salt solns. and the computer (15), has a culture liquid cutoff valve (22) for a chamber (21) with an aeration system (23), air flow rate **sensor** (25), oxygen (27), **carbon dioxide** (28) and pH-value (31) **sensors** and a differentiator (32).

USE/ADVANTAGE - For cultivation of bread baking yeast in the **microbiological** ind. Allowance is made for inertia of the control object, so making control more accurate and increasing the biomass yield by 4.8%. Overconsumption of air on aeration is avoided. Bul.16/30.4.84.  
1/1

L22 ANSWER 82 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1984:135288 HCAPLUS

DOCUMENT NUMBER: 100:135288

TITLE: Blood gas analysis with fluorescence dyes as an example of their usefulness as quantitative chemical sensors

AUTHOR(S): Luebbers, D. W.; Opitz, N.

CORPORATE SOURCE: Max-Planck Inst. Systemphysiol., Dortmund, 4600/1, Fed. Rep. Ger.

SOURCE: Analytical Chemistry Symposia Series (1983), 17(Chem. Sens.), 609-19  
CODEN: ACSSDR; ISSN: 0167-6350

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The use of membrane-protected, optically insulated fluorescent indicators (optodes) for the determination of pCO<sub>2</sub>, pO<sub>2</sub>, and pH in blood is discussed and examples are given. pCO<sub>2</sub> was determined by using a  $\beta$ -methylumbelliferone (I) layer optically shielded from the sample, thus avoiding interference from the optical properties of the sample. For pH determination, the HCO<sub>3</sub><sup>-</sup>-I solution was incorporated into polyacrylamide capsules (diameter 150-250 nm), and a method is described for correcting for ionic strength influence on the pH indicator. True pH was determined by using simultaneous pH measurements with 2 indicators (I and hydroxypyrenetrissulfonic acid) and an equation. For the determination of pO<sub>2</sub>, a layer of pyrenebutyric acid covered by a gas-permeable membrane (e.g. Teflon) was used.

L22 ANSWER 83 OF 86 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1983:59994 HCAPLUS

DOCUMENT NUMBER: 98:59994

TITLE: **Microbiological** assay of tetracycline with a potentiometric **carbon dioxide** gas **sensor**

AUTHOR(S): Simpson, D. L.; Kobos, R. K.

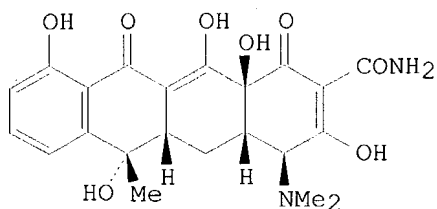
CORPORATE SOURCE: Dep. Chem., Virginia Commonwealth Univ., Richmond, VA, 23284, USA

SOURCE: Analytical Letters (1982), 15(B16), 1345-59  
CODEN: ANALBP; ISSN: 0003-2719

DOCUMENT TYPE: Journal

LANGUAGE: English

GI



I

AB A novel potentiometric method for the determination of tetracycline (I) [60-54-8] is based on the inhibition of respiration of a suspension of *Escherichia coli*, which is measured with a potentiometric CO<sub>2</sub> sensor. The dose-response curve of CO<sub>2</sub> produced vs. the logarithm of the I-HCl concentration is linear from 33 to 167 µg/mL. Good agreement with the label claim was obtained in the assay of a pharmaceutical preparation of I-HCl.

L22 ANSWER 84 OF 86 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN  
 ACCESSION NUMBER: 1983:158076 BIOSIS  
 DOCUMENT NUMBER: PREV198375008076; BA75:8076  
 TITLE: DEVELOPMENT AND APPLICATION OF A HISTIDINE SELECTIVE BIO MEMBRANE ELECTRODE.  
 AUTHOR(S): KOVACH P M [Reprint author]; MEYERHOFF M E  
 CORPORATE SOURCE: DEP CHEM, UNIV MICHIGAN, ANN ARBOR, MICHIGAN 48109, USA  
 SOURCE: Analytical Chemistry, (1982) Vol. 54, No. 2, pp. 217-220.  
 CODEN: ANCHAM. ISSN: 0003-2700.

DOCUMENT TYPE: Article  
 FILE SEGMENT: BA  
 LANGUAGE: ENGLISH

AB A highly selective histidine biomembrane electrode has been prepared by immobilizing the enzyme histidine decarboxylase (EC 4.1.1.22) at the surface of a potentiometric **carbon dioxide sensor**. The enzyme employed was extracted from *Lactobacillus* 30a. The use of concentrated enzyme extract rather than intact **bacterial** cells is shown to yield bioelectrodes with improved response characteristics. The resulting enzyme-based sensor responds linearly to the logarithm of L-histidine concentration between  $3 + 10^{-4}$  and  $1 + 10^{-2}$  mol/l with a slope typically of 48-53 mV per decade and a useful lifetime of over 30 days. The electrode can be used to assay histidine directly in urine samples with good analytical recovery and correlation with a fluorometric procedure.

L22 ANSWER 85 OF 86 MEDLINE on STN  
 ACCESSION NUMBER: 77135268 MEDLINE  
 DOCUMENT NUMBER: PubMed ID: 321044  
 TITLE: Computer-aided material balancing for prediction of fermentation parameters.  
 AUTHOR: Cooney C L; Wang H Y; Wang D I  
 SOURCE: Biotechnology and bioengineering, (1977 Jan) 19 (1) 55-67.  
 Journal code: 7502021. ISSN: 0006-3592.  
 PUB. COUNTRY: United States  
 DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
 LANGUAGE: English  
 FILE SEGMENT: Priority Journals

ENTRY MONTH: 197705  
 ENTRY DATE: Entered STN: 19900313  
 Last Updated on STN: 19900313  
 Entered Medline: 19770512

AB Despite the importance of biomass as a parameter in fermentation processes, there are no commercially available sensors suitable for its measurement. An indirect approach for the assessment of biomass concentration can be based on material balances and on the direct monitoring of fermentation parameters for which there are established **sensors** (e.g., gaseous oxygen and **carbon dioxide**). As a consequence, this method requires no assumption of cellular yield coefficients or rate constants. This approach is also readily adaptable to general use since it requires only some knowledge of the compositions of the substrate, cells, and noncellular products.

L22 ANSWER 86 OF 86 WPIDS COPYRIGHT 2004 THOMSON DERWENT on STN  
 ACCESSION NUMBER: 1976-B4272X [07] WPIDS  
 TITLE: Continuous measurement of carbon-dioxide content in carbonated liquids - using bend-pipe for sampling and differential pressure meter.  
 DERWENT CLASS: S03 S05  
 PATENT ASSIGNEE(S): (THOR-N) THORMETALL GMBH  
 COUNTRY COUNT: 1  
 PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
DE 2435493	A	19760205	(197607)*		

PRIORITY APPLN. INFO: DE 1974-2435493 19740724

AN 1976-B4272X [07] WPIDS

AB DE 2435493 A UPAB: 19930901

The apparatus incorporates a continuous sampler and a differential pressure meter. The former comprises a bend pipe with two radial connections arranged in the main conduit, so that a superpressure occurs on the outflow side as compared with the inflow. A current is thus set up through the differential pressure meter back to the inflow. The meter has an inlet through which the liquid flows into a measuring chamber connected through an outlet to a bridge with an orifice to the inlet of an adjacent measuring chamber, separated from the first by a membrane and containing a temperature sensor. the saturation pressure in the second chamber counteracts the static pressure in the first on the **membrane**, the **measured** difference being proportional to the **carbon dioxide** content.